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The Northern Forest Forum

Working for Sustainable Natural & Human Communities

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At Last, A Quantifiable Measure of Ecological Health - The Index of Biological Integrity

See Pages 19-23

Inside

Why I Support the Ban Clearcutting in Maine Referendum

I wholeheartedly support the Ban Clearcutting in Maine Referendum for three compelling reasons:

1) Ecological: The forests of northern Maine are in the worst condition since the retreat of the glaciers 12,000 years or so ago. There is virtually no old growth. There is virtually no mature forest. Except for Baxter State Park, there are virtually no large protected areas. Even if you don't give a fig for the biological integrity of a forest; even if your only interest in a forest is wood fiber—the Maine woods are in terrible condition. Even industry acknowledges that its 30-year cutting cycles have produced a serious "shortfall" (industry euphemism for the consequences of long-term unsustainable logging) in spruce.

2) Economic: Like the woods of northern Maine, the economy is a disaster. Job loss in the woods and in the mills over the past decade has occurred even as the level of cutting has increased. Worse, dominance of the regional economy by the paper industry over the past century has stifled economic diversification. Wood cut, in general, goes either to the paper mills or is exported, unprocessed.

Value-added opportunities in northern Maine are close to non-existent. Raw log exports to Canadian mills may benefit large landowners like Seven Islands, but they undercut local economic diversification. The future is even bleaker; where are the jobs in a liquidated forest?

3) Political: Democracy in Maine has been subverted by the timber industry which controls the legislature, the governor, and state agencies. Even very modest efforts to reform the worst forestry abuses have been squelched by industry cronies in the Maine legislature. Industry has sabotaged every effort to address forest practices. The Northern Forest Lands Study and the Northern Forest Lands Council were not allowed to assess forest practices because of the Maine delegation. Modest reform measures embodied in LD 1764 and LD 1347 were shot down in the last two sessions of the legislature.

Defenders of forest health have had no choice but to take the very, very difficult path of securing 55,000 signatures to a petition to force a public vote on the issue of clearcutting. That the signature-gathering proved to be a relatively easy task is eloquent testimony to the mood of Maine voters who are fed up with being disenfranchised by timber industry money and influence. In Maine, democracy only works when an aroused public seizes control back from the special interests. This Ban Clearcutting Referendum is democracy in action. If industry is unhappy with the prospect of settling forest policy by referendum, it has no one to blame but its own corrupting influence on Maine politics.

Arguments of Opponents

Opponents of the Referendum are quick to tell you what is wrong with this—or any—attempt to halt the worst abuses of the timber industry. But, when you challenge them to offer their solution to the problems, all they can say is "voluntary incentives" and "tax breaks." They are only interested in perpetuating the abuses of the status quo.

Opponents of the Referendum allege that there are "technical problems" with the wording of the Referendum. While I grant that nothing written by humans is perfect, this is a sound referendum based on responsible science. And remember, there are more than a few "technical problems" with perpetuation of the status quo. When compared to the massive crisis caused by the status quo, the problems associated with the Referendum are trivial indeed.

Opponents allege that we haven't proven the scientific harm of clearcuts. I believe readers of the **Forum** will disagree. Furthermore, isn't it about time we ask proponents of clearcuts to show us the scientific proof that clearcuts benefit forest health—or even evidence that clearcuts don't degrade biological integrity. The **Forum** will gladly print any peer-reviewed, scientific literature that demonstrates the ecological benefits of destroying a forest.

Opponents scream that the Referendum will cause massive job loss. This is nonsense. The Ban Clearcutting Referendum may be the best thing ever to happen to the northern Maine economy. We need an economy that rewards low impact forestry practices, that promotes value-added manufacturing instead of raw log exports and biomassing, and that promotes more labor-intensive work rather than the massive mechanization and automation that has transformed the industry in recent decades.

Besides, isn't it curious that industry cries "job loss" when citizens exercise their democratic right to protect the life support system; yet, these same industry voices were silent when over 3,000 mill workers lost their jobs in the last decade and there was a 40% decline in woods jobs during a period when industry enjoyed record profits?

Some people in Maine have pinned their hopes on the Sustainable Forest Management Council (SFMC) to address issues such as clearcutting, overharvesting, etc. They believe it is still possible to negotiate with industry in good faith to resolve these problems. Would that it were true! But, the SFMC—designed to exclude the very voices who inspired 55,000 voters to sign the Referendum—is not going to address these issues honestly and thoroughly; it, like the Northern Forest Lands Council, is controlled by industry. And, any hope of good faith bargaining with industry was shot down by the decision of the Maine Forest Products Council and other industry heavyweights to hire the anti-environmental propaganda firm of Winner Wagner and Mendelback of San Francisco. These folks are going to spend millions of dollars to wage all out war—lies, distortion, misrepresentations, scare tactics, economic blackmail—in a lost cause.

By contrast, the Referendum is going to win precisely because real people have real concerns about the future of natural and human communities. They are going to exercise their democratic rights—and responsibilities—with honor. An aroused, informed citizenry can not be defeated. We have no choice; we're doing this for our grandchildren's grandchildren.

—Jamie Sayen

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Memorial Service For Lowell Krassner

There will be a memorial service for Lowell Krassner on Sunday, February 11 at 2 p. m. at the Unitarian Church (Church and Pearl Street—top of the Church Street marketplace mall) in Burlington, VT. *(See Memorial on page 3.)*

A Letter Home From Alaska ~ Large Wildlands Work

from Brad Meiklejohn

The smell engulfed me. A pungent cloud reeking of rotting fish swarmed about my head. My usual evening walk along the neighborhood stream had decidedly new flavor tonight.

Half-eaten fish carcasses were strewn along the streambank, and the riffles were filled with live 30 pound king salmon! The stream, barely six feet bank to bank, held thousands of big fish. I could scarcely believe it but there were salmon spawning in my own backyard! And judging by the steaming piles of bear shit amid the munched fish carcasses, my backyard also serves as a dinner table for grizzly bears.

Randolph, New Hampshire is my hometown but I don't live there anymore. Neither do salmon. Salmon stopped spawning in the Upper Ammonoosuc River late in the 19th century when the Connecticut River dams went up.

I live in Alaska now. Not miles from the nearest road or neighbor, but in a suburb of Anchorage, Alaska's largest city at a population of 260,000. Frankly, Anchorage is a disgusting city plagued with vicious crime, a blight of strip malls, a "boomer" culture. The running joke is that Anchorage is only an hour's drive from Alaska.

At the same time, though, salmon still spawn in most of Anchorage's streams, a pack of seven wolves roam a city park, and brown bears are frequently seen in the suburbs. All this amazes me constantly, but scarcely draws the attention of long time residents. I gawk at the bald eagles perched outside the post office while most folks hardly notice. My neighbors cannot understand the excitement of watching salmon spawning in the backyard creek. They think I am foolish to walk the stream where bears catch their meals. But they did not grow up in New England, where the streams and woods are empty of the things that belong there.

Sadly, I finally understand how much New England has lost. John McPhee, a easterner himself, expressed a similar awakening in his Alaska book, **Coming Into the Country**: "I may have liked places that are wild and been quickened all my days just by the sound of the word, but I can see now I never knew what it could mean."

Ecological amnesia plagues all of us. We have forgotten, or never knew what belongs here. The decay of the natural world is incremental and our memories are short. We don't miss what we don't remember. A child who grows up next to an empty river doesn't miss the salmon that belong there. This lack, or absence, or void only becomes vivid when you see what it could be like.

Alaska can sere as a measuring stick for New England. Most of the native species are still found in Alaska in healthy populations, including wolves, wolverine, brown bear, caribou, bald eagles, and salmon. These animals are not an inconvenience. They do not stifle the economy nor threaten livelihoods. And neither is the presence of wild animals a rare, traffic-stopping spectacle. Because many rely on wildlife for subsistence, Alaskans expect the animals to be there, perhaps even take them for granted. Wild animals are part of the fabric of life in Alaska.

It is easy to be snobbish about Alaska, but that is not the point. The point is that New England's impoverished ecological condition can be viscerally understood when you see the real thing. In fact, because of its temperate climate, New England was at one time biologically richer than Alaska. Now, after 200 years of degradation New England is but a shadow of its former self. The scene is pastoral and pleasant, but like Europe, decidedly empty.

I am saddened by this realization. The woods and streams of Randolph, New Hampshire, seem barren to me now, and on my visits I sense the ghosts of salmon and wolves. Polyannas praise the return of New England's trees, but these are **not** New England's forests. It is pathetic to hear people debate whether to allow a few wolves to live amongst us, or quarrel over which handful of rivers we will allow salmon to survive in. It is not right that seeing a bald eagle is such a rare and precious thing. Wolves, salmon, bald eagles and many other animals should be common—they should be part of the fabric of New England, too.

What can Alaska teach New England? Most importantly, Alaska demonstrates that large wildlands work. Millions of acres of parks and refuges leave plenty of room for wildlife. These wildlands are unfragmented by roads, human activity is minimal, and the rivers are free-flowing and unpolluted. Alaska leaves room for wildlife.

Of course, some might say "Alaska is Alaska, and New England is, well, civilized." A few token "ecological reserves", maybe 5-10,000 acres, should take care of it, and is the best New England can do.

I say New England can do much better. New England should have several wildlands each greater than a million acres. We can close some roads, remove some dams, start leaving more areas alone. Anything less condemns New England to a greatly diminished future.

Sadly, New England will not take these steps because most people do not know what they are missing. I invite you to come to Alaska to see what New England used to be like and could be like.

As the trees have proven, New England is resilient. Abundant wildlife will come back if we let it. If we give it room.

In Memoriam: Lowell Krassner

Northern Forest Activist Extraordinaire

The Northern Forest has lost one of its most generous and indefatigable friends. Lowell Krassner, the finest, most persistent citizen forest activist I've known, passed away in mid-January at the age of 59.

Lowell was a wonderful friend, and he was one of the founders of **The Northern Forest Forum**. In fact, when I was in doubt about the feasibility of producing a Northern Forest periodical, Lowell's support, enthusiasm, and ideas proved decisive.

For decades Lowell and his beloved wife, Diane Geerken, were the heart and soul of the Vermont chapter of the Sierra Club. His Sierra Club resume is mindboggling: Sierra Club (SC) member and activist for over 30 years; founding member of the Vermont Alliance of Conservation Voters; Conservation Chair, Vermont Chapter SC; member of War on the Environment Campaign Steering Committee; Chairman, SC Great Northern Forest Ecoregion Task Force.

Lowell was instrumental in the passage of the Vermont Wilderness Act of 1984. He represented the Sierra Club in a wide range of issues related to forest protection including: organizing SC involvement in relation to the development and release of the USDA Forest Service plan for the Green Mountain National Forest; coordinating the SC's intervention in the Appalachian Trail/Killington Ski area issues; assuring SC's involvement in the Lamb Brook lawsuit against the Green Mountain National Forest.

Chris Ballantyne, regional representative for the SC tells me that Lowell "was one of the most effective, articulate Club volunteers that we have ever had the pleasure of working with. He was known for his uncanny ability to pull together activists around kitchen tables and hammer out creative strategies for land and forest protection."

But, the beauty of Lowell and his work on behalf of wild critters and places cannot be measured by a list of his activities. What this list cannot convey is his warm and generous nature. Without question, Lowell was the least egotistical environmentalist I've ever met. He did not engage in "turf battles" with other environmental groups; fighting on behalf of Earth was his only "turf battle."

Lowell was the model citizen activist. He did his homework; he paid attention to the fine print; he showed up at critical meetings and hearings; and he graciously, but resolutely set the record straight when others would have shortchanged efforts to protect the environment.

He had a delightful sense of humor, and he was invariably able to find humor in the machinations of the anti-environmental forces in the Northern Forest region and beyond. One of his favorite quotes was from former Alaska Governor Walter Hickel: "We can't just let Nature run wild."

As the most seasoned veteran of Northern Forest issues—by decades—Lowell was quick to assist newcomers. When others inside and outside the environmental community vilified me in the early days of the Northern Forest Lands Study for my "radical views", Lowell went out of his way to encourage me. His support and kindness never wavered. When we disagreed, I always valued the reasons for his dissent.

As Chris Ballantyne has said, Lowell is irreplaceable. But, we, his friends and colleagues, are obliged—and challenged—to fill the void. If no one of us can replace Lowell, then, collectively, we must redouble our efforts and encourage legions of new activists of all ages and backgrounds to continue the life work of our beloved friend, a man who led by modesty and deeds and an ethic of service to community.

Farewell, Friend.

—Jamie Sayen

Wildlife Biologist Says Eastern Coyote Deserves Greater Respect

Dear Jamie,

You ended your Big Bad Wolf article in the fall 1995 issue of **The Northern Forest Forum** with a call for debate on substantive issues related to the reintroduction of wolves into New England. Before both sides get too rancorous on the question of deer vs wolf; eco-tourist vs hunter, I'd like to insert several short commentaries:

White-tail Deer

First, the notion that deer are somehow artificially maintained in northern New England by wildlife departments who are catering to hunters has to be dispelled. Most settlement and pre-settlement accounts show very clearly that mammalian communities in northern NH and VT at the time of settlement were much more diverse than those of present day. Deer, as well as moose, caribou, bear, large predators and furbearers, were present in large numbers. Unregulated harvest caused extirpation of the major predators, sought-after furbearers, and large ungulates generally within 20 years of settlement.

Extirpation occurred well before substantial clearing of forests for agriculture or timber. Deer and other species did not disappear due to habitat change but rather due to exploitation by people who wanted to eat their flesh, wear their skins, or protect their livestock.

Deer recolonized faster than other species, but recolonization was still a lot slower than what most people believe: densities of deer remained low for around 40 years until the 1920s. Although deer populations will frequently fluctuate with winter weather, the factor that best explained the increase of northern deer populations in the early 1900s was the creation of modern game laws and the beginnings of effective enforcement. With protection from exploitation, deer populations were able to grow and peaked in the 1960s in northern New Hampshire—a time interval delayed sufficiently to suggest no apparent correlation to the flush of early successional forests caused by extensive timbering in the late 1800s.

Deer managers in the Northern Forest region are much more concerned about mature stands of spruce/fir than of regenerating clearcuts. Deer are near their northern range in northern New England and rely on mature softwood for winter shelter. Demanding winter conditions keep deer populations at a much lower density than southern ranges—food supplies, even in mature forests, are therefore more than adequate over the Northern Forest to support deer. Availability of winter shelter has always been the bottleneck. New Hampshire, for example, assigned biologists, beginning in the 1950s, to work solely with paper companies to seek voluntary retention of mature softwood growth, travel corridors and balanced age classes. It was not called biodiversity in the 1950s but many of the goals overlap with current initiatives for sustainable forestry.

Eastern Coyote

My second commentary is what I perceive as the bad reputation assigned to eastern coyotes from both sides of the environmental community. I've often heard coyotes referred to by conservation biologists as "weed species" that somehow take unfair advantage over more "charismatic indigenous species". And, of course, hunters malign coyotes because they eat deer. So in the context of any debate over timber wolf reintroduction, the role of eastern coyotes in the New England region needs to be well understood.

Hunters are worried about deer numbers because eastern coyotes are a known deer predator and have been shown to be responsible for declines in local deer populations. Because timber wolves displace coyotes, a direct outcome of wolf reintroduction would be less coyotes. Two other outcomes of wolf reintroduction are subsequently possible: timber wolves would eat the same number of deer as coyotes; or timber wolves would prey less on deer because of the ready availability of moose. To my knowledge, no one has definitively calculated the change in deer predation caused by such a predator shift. But until such numbers are known, any argument either for or against wolf reintroduction that uses deer predation as supporting evidence is unfounded.

Likewise, there is little scientific support for the conservation biologists who want to clean up the ecosystem by getting rid of coyotes and restoring timber wolves. *[Ed. Note: I am unaware of conservation biologists promoting the persecution of eastern coyotes. I share your opposition to such proposals.]* Ecosystem management means that natural functions of genetic drift should be supported, not supplanted by artificial human tinkering.

Eastern timber wolves were believed to be exploited to extinction (in NH) by 1860. Similar extinction times apply to ME, VT and NY. It took 60 years or so, but the vacant niche left by eastern timber wolves was filled by a new *Canis*—a hybrid between western coyotes (*Canis latrans*) and a small race of wolves in southern Ontario (*Canis lupus lyacan*). Barbara Lawrence and William Bossert of Harvard University, among others, demonstrated the degree to which eastern coyotes were intermediate in form between western coyotes and wolves. Ronald Nowak in **North American Quaternary *Canis*** sums up the issue of New England *Canis* best: "It is thus reasonable to suppose that hybridization between wolf and coyote in southeastern Canada has, and probably still is permitting the flow of genes from one species to the other. Evidently wolf genes have spread through much of the coyote population, and resulting wolflike characters have been phenotypically expressed in *Canis* of the extreme northeastern United States. The introgression may have assisted the coyote population of the region to adapt to and flourish in an environment far from the original prairie habitat of *C. latrans*."

Eastern coyotes therefore suffer from the indignity of their name—because they are intermediate between timber wolves and western coyotes (just as the red wolf of southeastern US is intermediate to *C. latrans* and *C. lupus*) they just as easily could have been called eastern wolves and spared the acrimony over whether or not to introduce their larger cousins.

Therefore, my commentary on wolf reintroduction is brief: reintroduction is unnecessary because wolf genes came back on their own and they are doing very well.

Rec Equipment Excise Tax

Off the subject, but you also asked where the national excise tax on recreational equipment was? I do not know what the Northern Forest Lands Council recommendation was based on, but the International Association of Fish and Wildlife Agencies has been championing a Wildlife Diversity Initiative since 1990. The Initiative is designed to fund conservation, education and research on the more than 2,000 species of birds, mammals, reptiles and insects that currently lack any type of programmatic attention by state fish and wildlife agencies. The Initiative is seeking a user fee on outdoor recreation equipment. Currently, more than 100 conservation groups and recreational interests have signed on as supporters.

—Sincerely,
Scot J. Williamson

Scot Williamson is a wildlife biologist working as a field representative for Wildlife Management Institute. He lives in Stratford Hollow, NH.

A letter from Jhym Phoenix, Belfast, Maine, notes: "Volume 4, no. 1, page 17 (under the photo) says that since 1980 2,000 acres of forest have been clearcut. Shouldn't that figure really be 2,000 square miles? If your figure was wrong, would you please reprint the photo with the correct area?"

Editor Responds:Here's the photo. Actually my mistake is worse than you suggest. I repeated the same error in Volume 4, no. 2 on page 3 in another photo caption. I will redouble my efforts not to say anything false about the timber industry in Maine.

Former Reader Objects to *Forum* Bias

I choose not to subscribe to your "newspaper." I find your reporting to be emotionally charged with few facts in support. You consistently and persistently bash timber harvesting but fail to outline what you'd prefer to see or offer real alternatives.

—Dennis McKinney—Forester
New England Forestry Foundation

Editor Responds: We will respect your wish not to receive the **Forum**. *However, I am disappointed by your comments for two reasons: (1) You ignore the fact that we have published numerous articles on "Low Impact Forestry" techniques and practitioners for over a year; and (2) you never submitted your perspective. We'd have run it.*

Gov. Pataki Appointees Are Busy Rolling Back Environmental Protection for the Adirondacks

by Peter Bauer

About 42 percent of New York's Adirondack Park is protected as wilderness lands in the Forest Preserve. These lands are protected by the state constitution as lands to be held "forever wild." The remaining 58 percent is land privately owned by timber corporations, private clubs, utilities, corporations, and thousands of individuals. Development and some uses of the private lands are regulated by the Adirondack Park Agency (APA).

The APA contains many statutory loopholes—two-thirds of all development in the Adirondack Park in the last 20 years was not subject to APA review—but nevertheless the APA spearheads New York's management of the Adirondacks. The APA is governed by a Board of Commissioners appointed by the Governor. These Commissioners are charged to interpret and apply a complex statute that invests a great deal of discretion in the Commissioners' collective judgment. As we've seen over the past six months, when these Commissioners want to protect the Park they can, and when they don't want to protect the Park, they don't.

Six months into his first year in office Governor George Pataki replaced six of the APA's eleven Commissioners and replaced the APA's Chairman. Gone are three citizen Commissioners John Collins of Blue Mountain Lake, the former Chairman, Peter Paine of New York City, and Elizabeth Thorndike of Rochester.

Governor Pataki also replaced the representatives from the three state agencies (the Departments of Economic Development, Environmental Conservation and the Department of State), the directors of which are voting Commissioners. Among those dismissed from state positions was Bob Bendick, one of the finest environmental public servants in New York's history, and former chair of the Northern Forest Lands Council. Five carry-overs from the Cuomo administration remain. Of these five, two have consistently supported a pro-business, pro-development agenda, and a third has been a swing vote. Governor Pataki now has a strong majority at the APA to set Park policy well into the future.

Given the Boot

The three Commissioners removed from the APA by Pataki constituted, along with the former executive director Robert Glennon, the APA's environmental heart and soul. John Collins, a fifth generation Adirondacker, served for ten years, the last three as Chairman. Peter Paine served for 20 years and successfully navigated the agency through many issues. A former Rhodes Scholar and lawyer, Paine was a member of Governor Nelson Rockefeller's Temporary Study Commission on the Future of the Adirondacks that recommended the formation of the APA in 1971. Elizabeth Thorndike founded the Center for Environmental Information in Rochester and had been a member of Governor Cuomo's Environmental Advisory Board.

Together, these three Commissioners led the fight against the notorious land speculators, the Patten Corporation, led the fight against the Glen Eagles Corporation's attempt to tremendously expand the old Lake Placid Club, sought to limit development in Resource Management areas, orchestrated a citizen Task Force to study and recommend improvements for APA operations, prevented the importation of garbage from outside the Adirondacks, crafted an outstanding policy guide, **The State Land Master Plan**, for the management of the Forest Preserve, and worked to make APA policy that only the best development would be approved by the APA.

Estuary turned into marina on Lake George. Will the Pataki APA protect biological integrity of the Adirondack Park, or will it protect the pocketbooks of developers? Photo © John McKeith.

Robert Glennon was also fired as the APA executive director. Glennon, one of New York's brightest and most dedicated environmental lawyers, worked at the APA for over 20 years, ranging from staff attorney to Counsel to executive director. First and foremost, Bob Glennon, like the three Commissioners dismissed, served the Adirondack Park. A brilliant environmental lawyer, Glennon's decisions were challenged, but his work interpreting and applying the APA statutes were nearly always upheld (when challenged, just 3 out of over 100 APA decisions were overturned).

Bucking a trend of former APA executive directors who go on to big paydays in the business of developing the Park, Glennon has since signed on with Environmentally Sustainable Development, Inc., a non-profit that works around the globe to protect landscapes while building viable local economies.

The Pataki APA: Controlled by Local Government

Throughout the last 20 years of the APA, there has been a tension between balancing the statewide interest in protecting the Adirondack Park and the local interests in development and economic expansion. Many local leaders maintained through the last 20 years that they had been shut out of the Park's decision-making and had been unfairly made to comply with land use regulations to which others across the state were not subjected.

Governor Pataki has appointed Greg Campbell of Keeseville as his new Chairman. Campbell, the former Clinton County Republican Party leader and early Pataki supporter, was on the Board of the Adirondack Conservation Council for many years, a group that regularly called for the abolition of the APA. Dan Fitts, an administrator at the APA and longtime aide to powerful New York State Senator Ron Stafford, who represents most of the Adirondacks, has been tapped as the new executive director. Alexander "Sandy" Treadwell, the former Essex County Republican Party leader, has been elevated by Pataki as the New York Secretary of State, a voting member of the APA.

These three, together with two Cuomo holdover Commissioners, who have been staunch supporters of limiting the authority of the APA, are leading a new business-friendly APA that primarily serves the interests of local government.

Local government leaders who have cried out for years that they are capable of running the APA and should run the APA, now are solidly in charge of the Pataki APA. In short, to borrow a page from Calvin Coolidge, the business of the Pataki APA is business.

New York's Newest Dumping Ground

In September, the Pataki APA approved a resolution to exempt the Essex County landfill from a 1992 resolution forbidding the importation of garbage into the Adirondack Park. Essex County is now in the process of selling its landfill to an outfit called Serkil, Inc., of Castleton, New York, that plans to import 100,000 tons of garbage into the Park annually. The Pataki APA initially determined that the sale and expansion (from 95 tons per day to 500) were not the business of the APA. After citizen outcry, Governor Pataki has ordered the APA to reconsider its position.

Return of the Clearcut

The Pataki APA made another quick decision to grant a general permit for salvage clearcutting to private landowners who had timber stands damaged by the July wind storm. The general permit simply required landowners to provide the APA with a report of clearcutting they undertook in salvage operations. This general permit was characterized as a mail order clearcutting permit. The APA arbitrarily declared that a clearcut could be commenced if just one in three trees was damaged. After concerns were raised about wetlands protection, road construction, site reviews, harvesting on slopes, and enforcement, Governor Pataki ordered the permit withdrawn and redrawn to address these concerns.

Gutting the Staff

The 60-person staff of the APA has been under fire since its beginning, and as a result, it has never been adequately funded. The APA Task Force, the citizen's review of the APA, recommended in 1994 that 11 new positions be added to improve the efficiency of APA operations. For 1996, the Pataki APA leadership has crafted a budget that arbitrarily cuts the APA staff by 20 percent. Meanwhile, they've created a new position, Deputy Director, and hired a former DEC staffer, Karyn Richards, who is well-liked by several APA commissioners. The leadership of the Pataki APA is attempting to gut the effectiveness of the APA by cutting 12 of its most dedicated staff members, while padding administrative positions.

Going After the Forest Preserve

Following a pattern of serving the narrow interests of those who have long opposed the APA, the Pataki APA is entertaining ideas about opening up the Wilderness areas of the Forest Preserve to float planes to fly in and out. Ostensibly to assist those who are physically disabled and cannot reach remote areas of the Forest Preserve, this effort marks the beginning of an expected attack by the Pataki APA on the integrity of the State Land Master Plan.

Will the Real George Pataki Please Stand Up?

The Pataki APA is following a course of assaulting the last 20 years of environmental protection for the Adirondack Park. During this time the APA has had serious public relations problems and seemed incapable of publicizing all the good things it accomplished. Governor Pataki has stated he is committed to the Park, but placed political paybacks ahead of his environmental commitment. As a result he has twice had to personally intervene in the last six months to reverse decisions of his appointees. Governor Pataki has maintained that he is a champion of New York's environment and the Adirondack Park, while at the same time allowing his appointees to roll back environmental protections across New York and the Adirondacks.

Peter Bauer is Executive Director of the Residents' Committee to Protect the Adirondacks, a grassroots organization of dedicated Adirondack Park citizens working to safeguard the health and integrity of the natural and human communities of the Adirondack Park. He can be reached at: RCPA, POB 27, North Creek, MY 12853, tel. 518-251-4257.

Ban Clearcutting in Maine Referendum Provokes New Timber Industry Propaganda War

by Jonathan Carter—Director Ban Clearcutting Campaign

On January 29, 1996 organizers of the Ban Clearcutting in MaineReferendum submitted 55,000 signatures of registered voters in Maine to place the Referendum on the November 1996 ballot.

The collection of 55,000 signatures to Ban Clearcutting in Maine has set off an avalanche of political maneuvering and posturing on the part of the timber industry. Even though the signatures have not yet been officially sanctioned by the Secretary of State's office, the industry has launched a high stakes campaign of distortion and misinformation.

The airwaves are filled with paper company ads depicting healthy forests being "managed" sustainably for the future. Bill Vail of the Maine Forest Products Council, chief industry lobby, has formed a PAC called Citizens for a Healthy Forest and Economy.

In addition, the industry has hired a Virginia-based polling outfit to hold focus groups around the state—paying people $20 an hour to answer questions around the issue of clearcutting. The information gathered from the focus groups will be used to develop media "brainwashing" techniques to counter the overwhelming anger of Maine citizens to the forest destruction carried out over the last 15 years.

Winner Wagner and Mendelback of San Francisco has been retained by the Forest Products Council to develop and wage its promotional and media campaign. This firm specializes in ballot question campaigns and has a reputation for being able to crush a popular environmental initiatives by undermining the "Green" message with an effective, expensive Madison Avenue delivery system. It is clear that the industry will spare no expense to "educate" the public about the "benefits" of clearcuts.

The good news about all of this industry hype is that we can be sure from its response that the timber industry is running scared. If the election were held today, the Ban Clearcutting Referendum would win hands down. The Ban Clearcutting Committee has organized and is actively working to raise funds to develop alliances. This referendum is of national significance. It is about time that the destruction of the temperate forests of the East receive the same recognition of importance as those of the Pacific Northwest and Alaska.

This Referendum not only sets a national precedent for eliminating clearcutting as a silvicultural tool, but it puts the industry on notice that the citizens of Maine and the rest of the nation will not tolerate the wanton destruction of our natural heritage in the name of huge corporate profits. The forests are more than just fiber factories. They are complex ecosystems on which virtually all forms of life are dependent.

We are going to be running a pro-forest campaign which clearly articulates the need for constructive change based on science. It is well-documented that massive clearcutting is ecologically destructive at the niche to the ecosystem levels of organization.

We cannot win this campaign without the support of the grassroots. Whether you live in Maine or not, we need every **Forum** reader (and their friends) to get involved. The Northern Forest knows no political boundaries, and with over half of it in the state of Maine, we must all work together to win this Referendum. We cannot hope to save the forests for the future unless we are willing to make the sacrifice of time and money.

Please send a generous contribution to: Ban Clearcutting Campaign, POB 2218, Augusta, ME 04438, or call 207-623-7140 and get involved.

Opponents of the Ban Clearcutting in Maine Referendum say there is no need for further regulation of forest practices in Maine because, they claim, the 1989 Maine Forest Practices Act is doing a good job. This photo of S.D. Warren lands in western Maine show just how well the Forest Practices Act is working. Opponents also assert that Maine's economy will collapse if this kind of cookie-cutter-style forest liquidation is banned. Photo © John McKeith.

Sustainable Forestry?

Forest Service Survey Shows Overcutting of Red Spruce and Hemlock in Washington & Hancock Counties

by Mitch Lansky

Forester intentions

For some reason, forest industry representatives have not been enthusiastically bragging about the early results of the latest US Forest Service survey of Washington and Penobscot Counties. As Bill Butler wrote in his "sustainability" article in the last issue of the **Forum**, the Maine Forest Products Council ran its own (rather vague) "study" of timber supply. Before the USFS had a chance to release federal data, the MFPC announced the happy news that the situation is not as bad as some people expected. Some industry representatives even tried to convince newspaper editors to not bother printing the early results of the US Forest Service effort.

Perhaps the source of discomfort for the industry is the trends for several species. These trends do not reinforce the image of companies living within sustainability principles—unless such principles are perverse. Assuming the bulk of cutting in these counties has been done under forester supervision, and assuming the trends indicate the intentions of forest managers, we can conclude that forest managers like red maple, but they do not like red spruce or hemlock.

These results are odd, because red spruce has long been the staple of both the sawmill and paper industries. Indeed, since 1850, when cutting of red spruce exceeded white pine, red spruce has been the "king of the forest." Apparently now, however, managers are weeding out red spruce in favor of red maple—which up until recently has been considered a "junk hardwood."

Sustainable Declines

While some in industry may claim that the decline of spruce is due to the "spruce budworm," the facts, as recorded by the US Forest Service, are that red spruce had a positive net growth in each county from 1982-1995, but it and hemlock were cut more heavily than any other species.

Hemlock, according to industry representatives, is supposedly an "underutilized species." Large quantities of hemlock were substituted in for spruce for studs and pulp. Hemlock was a popular log to ship overseas. Hemlock was the most heavily cut species in Penobscot County and the second most heavily cut species in Washington County. This is a rather heavy "underutilization."

In Washington County, the removal of just these two species, red spruce and hemlock, represented 48% of the volume of the entire cut of all species. In Penobscot County these two species made up 42% of the volume of all removals. The cut to net growth ratio for red spruce and hemlock in Washington County were 3.7/1 and 1.6/1 respectively. This means that only one cord of spruce grew for every 3.7 cords cut. In Penobscot County the cut to net growth ratio for red spruce and hemlock were 2.2/1 and 1.7/1 respectively. The inventories of red spruce declined 25% in Washington and 32% in Penobscot Counties from 1982 to 1995. Hemlock declined 26.5% in Washington and 12% in Penobscot Counties. Fans of red maple will be happy to note that that species increased by 14% in Washington County and by 42% in Penobscot County.

Forest Service Anomalies

It must be noted here that the Forest Service growth, cut, and inventory figures are, seemingly, contradictory. For example, in Washington County, the cut to net growth ratio for balsam fir was 1.6/1, yet the inventory increased 14%. The cut to net growth ratio for aspen, on the other hand, was .5/1, yet its volume declined by 41%. In Penobscot County, the cut/net growth ratio for fir was slightly less than one (more grew than was cut), yet its inventory declined by 18%. Likewise aspen, which grew more than was cut, also declined by 18%. I await the Forest Service's explanation of these anomalies.

Happy Prospects

For those who fear a decline in aspen and balsam fir, take heart: fir, red maple, and aspen are thriving in

Continued on page 31

Maine Forest Practices

After the Cutting is Done, What's Left?

Introduction
An Explanation of the Charts

What proportion of logging operations in Maine leave behind residual stands that are clearcut, understocked, or adequately-stocked for productive growth? How many acres per year does this represent? How do these figures differ by landowner type? No one can answer these questions precisely, but using state of Maine data, we can make some rough estimates.

The Data

The data used for this graph came from random sampling of forestry operations 1991-1993 done by the Maine Forest Service (MFS) in 1994 as part of a study, **An Evaluation of the Effects of The Forest Practices Act**. The MFS was asked by the legislature to study the extent and distribution of clearcuts, the management of separation zones between clearcuts, and the extent to which landowners are cutting to minimum standards.

The data are broken down by landowner type, timber type, and region. Unfortunately there are very few operations sampled, and, in some cases, few samples per operation. For partial cuts, I used data from 117 cutting operations. When one breaks the data down by landowner type and timber type, this leaves very few items per category. In one instance, there were only five operations sampled for one landowner category, and just one of these operations covered 90% of the land for that category. Since I weighted all the percentages by acreage, this one operation skewed the results.

The figures in this graph are not necessarily an accurate reflection of what is actually happening in the Maine woods. These are, however, the best data available of forest practices in the state. The results should be viewed with tolerance to their imprecision, but with an eye to some apparent trends.

The Landowners

The landowner categories are "industrial" (large landownerships connected with mills), "large non-industrial" (large landownerships not connected to mill), "private" (woodlot owners, some of whom are "stewards" and some speculator-liquidators), "contractor" (logging contractors who buy large lots and cut them), "other" (mostly public and Native American), and "all" (all categories combined).

Of the sampled acreage (including clearcuts) 59% was on "industrial," 14% was on "large non-industrial," 12% was on "private," 8% was on "contractor," and 7% was on "other." If these ratios applied to 1994, when one half-million acres were cut in Maine, this would mean that 295,000 of those cut acres were on "industrial" lands.

The Standards

Clearcut: The MFS defines a clearcut, primarily, as a wood cutting operation that leaves behind less than 30 square feet of basal area. There are exceptions to this that deal with overstory removals (cuts that remove the larger trees and leave behind a regenerated stand) that leave certain sizes and stocking of regeneration.

Basal area: A method of determining *stocking*, the occupation of a forest with trees. Basal area is a measure of the cross sectional area of the trunks of trees measured at 4.5 feet above the ground.

C-line: The C-line is defined as the minimum stocking for a manageable stand. This stocking level varies by timber type and by the mean diameter of the stand. I used a 6-inch mean stand diameter which, in a commercial cut, would occur after a very heavy diameter-limit cut down to merchantable limits. The level used here, therefore, is very conservative. The C-line is not, generally, a recommended stocking level, but stands at the C-line can reach minimum recommended stocking levels in ten years. This means that a landowner would normally wait several decades for the stand to attain enough volume for the next commercial partial cut.

Understocked: A partially-cut stand is understocked when the residual tree basal area does not meet the C-line. Since I used such a low standard for the C-line, my estimate of the level of understocking is very conservative.

B-line: The B-line is the minimum stocking for an adequate growth response. Like the C-line, the B-line varies according timber type and mean stand diameter. I used an 8-inch mean stand diameter level for the B-line, which leads to nearly the same stocking level as that recommended in silvicultural guides for uneven-aged stands. The B-line (or the equivalent standard for uneven-aged stands) is a recommended minimum level for both productivity and quality. Cutting cycles from the B-line can be 15 or fewer years apart.

Conclusion

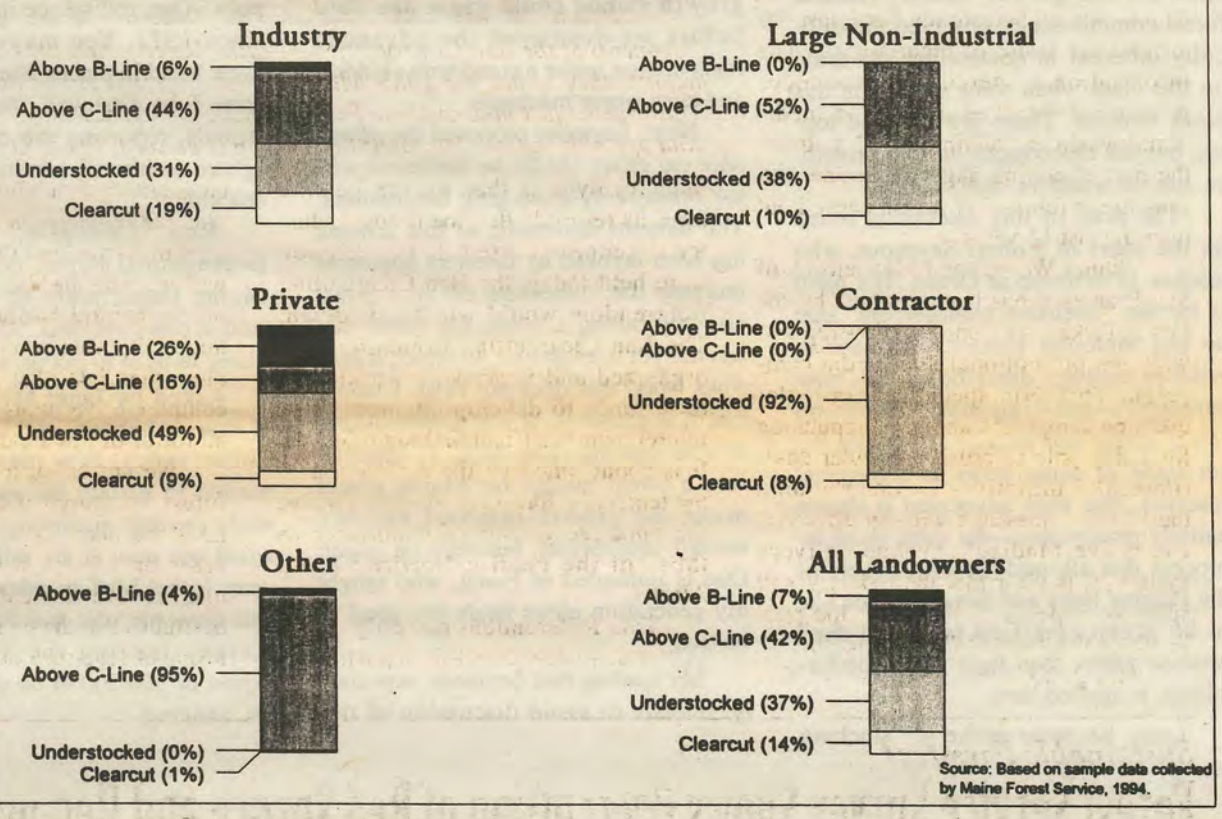
There are still some people suggesting that we do not need to change direction because there is no proof that there is a problem. The Maine Forest Service data, however, show that there is a problem. More than half the cutting leaves behind clearcut or understocked stands. More than 90% of the cuts fail to meet silviculturally recommended residual stocking levels. This study does not even address recommended ecological standards.

The problem is most severe with certain landowner classes. Nearly all the "contractor" and half the "private" land failed to meet minimal stocking standards. Some private and public lands and even some industrial lands did have recommended residual stocking levels, demonstrating that it can be done. The data also show that industrial landowners are operating on a scale out of proportion to other landowners. When they clearcut or understock, the impact can be big—the damage is concentrated.

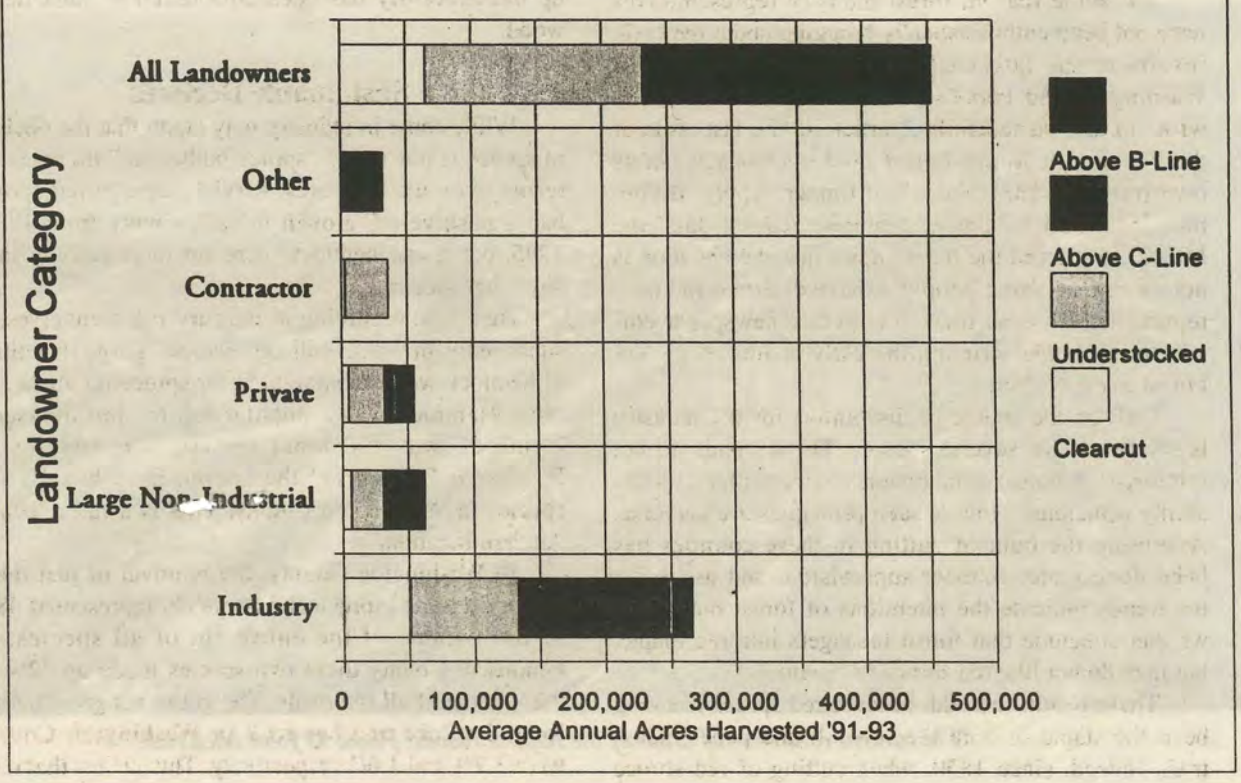
Comprehensive Report Available

For a more detailed analysis that looks at pre-harvest stocking, residual quality and logging damage, and percent of removal by landownership and timber types, write: Mitch Lansky, HC 60, Box 86, Wytopitlock, ME 04497. Please send $5 to cover printing and postage.

Proportion of Maine Forest Harvests from 1991 to 1993 Meeting Various Residual Stocking Standards - by Landowner Type.



Average Annual Forest Area Harvested in Maine from 1991 to 1993 by Category of Residual Stocking and Landowner Type.



Maine Sustainable Forest Management Council Avoids Current Conditions

by William Butler

Maine's Council on Sustainable Forest Management (SFM) met, for the sixth time, Down East in Washington County on December 14, 1995. The meeting was devoted almost exclusively to the criterion which most strongly calls for quantification—as they had it, the *capacity of the forest to support a stable (non-declining) or increasing harvest of quality forest products.* Starting from what I would call the wrong end of the problem, the ten members spent an hour asking themselves: if landowners, either small-private or large-industrial were the target; whether only the unorganized territory (mostly paper industry) was to be brought to account; or, was the small-owners bloc responsible.

Harry Dwyer, a forester-logger representing Small Woodlot Owners Association of Maine (SWOAM) argued that they couldn't boil it down to the level of the individual small holder. Tom Doak, Maine Forest Service (MFS) staff, volunteered that in areas of mostly small forest ownerships, common in southern Maine, MFS could chart cut and growth. Charles Gadzik, forest commissioner, observed the difficulty inherent in controlling the drain on this class when some owners in this block overcut. These are all good topics, but not those requisite to a growth-vs.-cut (or wood-vs.-mill) budget.

The draft of this discussion relied on the ideas of Robert Seymour, who teaches silviculture at Orono. His pitch is for the "intensive management" that he and Malcolm Hunter, professor in wildlife ecology describe as the "new forestry"—growing more timber on fewer acres, and possibly allowing the set-aside of some areas as ecological reserves. The view advocated is almost entirely prospective—the same thought-process that allowed Stephen Schely of the Pingree heirs and Seven Islands Co. to be green certified for what they promise rather than their recent performance, is applied here.

Later, Seymour spoke of "stocking levels," but attempted to avoid the corollary, standing volume; a forest with short, small diameter trees may be "well stocked" but have little timber volume.

When Don Tardie of Fraser Paper said that the council must consider the socio-economic effect, meaning jobs, Seymour responded that ensuring biological integrity leads to socio-economic sustainability, followed by the observation that, "There is no immediate link between present jobs and today's forest practices—they are 40 years apart." Tardie noted that he had not said that landowners are required to increase jobs, followed by Peter Triandafillou of James River saying, "We can't compel the landowners." Tardie persisted, "The jobs are in an increased growing stock." At last, Seymour offered his "silvicultural fix," stating that "one cord per acre per year is achievable."

To a listener who recalls US Forest Service lectures that "you should be growing two or two-and-a-half cords of spruce per acre per year, and more with fertilization and genetic improvement," it seems to trivialize silviculture to settle for one cord. Unmanaged, second-growth stands could grow one cord before we destroyed the advanced regeneration under a stand with skidders and even worse machines.

Next, Seymour proposed the *allowable cut effect* (ACE) be instituted now for intensively-managing landowners. The dubious arithmetic of this scheme has been invoked by foresters hoping to increase the immediate cut in a forest now, by taking a credit for wood that has not yet been grown. In effect, it borrows wood that does not exist. I would call it a gimmick, if not disilvicultural double-dealing. The ACE, if factored into a forest budget for Maine would move the growth-removal balance toward equilibrium, but only on paper. One is reminded of Ponzi, who taught my generation about deals too good to be true.

My reading that Seymour, especially, intends to avoid discussion of the present condition of what, in 1971, was eight million acres of spruce-fir, the largest and most valuable component of the Maine forest, may be overly subjective. But, remarkably, Gordon Mott, under whom Seymour completed some of his analyses of the budworm outbreak in the early 1980s, submitted written comments for Natural Resources Council of Maine and Maine Audubon at this hearing. Mott asks that the council's work be related more directly to current conditions, stating, "Firstly, the work has not considered the current concrete condition of the Maine forest." He applies the adjective *current* seven times on his first page.

Countering any intent to confine our outlook to the agro-forestry promises, we have now the USFS inventory describing the current condition for two, large, largely industrial-owned counties—Washington with 1.4 million acres of supposed forest, and Penobscot with 1.8 million acres. These are "preliminary" in the sense that the calculations for the other 14 counties are not yet complete. The charts show net changes in spruces and in hemlock, now the substitute for spruce as softwood Kraft pulp. Also, red spruce inventory change since 1971. You may anticipate this same trend in places like the one million acres John Cashwell, manager of Seven Islands, reporting the criticism by the "green certifiers", admits has lost spruce stocking.

Ron Lovaglio, recently of International Paper, now head of the Maine Department of Conservation, said at one point that "some time we are going to have to put up a number."

Asked by Janet McMahon of the Maine chapter of The Nature Conservancy, how many acres were needed to sustain the paper- and sawmills (wrong question), Lovaglio put wood use now at six million cords per year; Isabel McKay asked if that figure was domestic use, and Ron said it was, thereby leaving the Seven Islands export of 300,000 or so cords, plus others, hanging.

Here we are getting to the point—we are using explicit numbers. There still is fuzzy language like "harvest volumes must not exceed those deemed sustainable," and this courageous goal: "Over a 40-50 year period, Maine will double the average annual yield of high-value species (*relative to the baseline yields of the current forest from Seymour and Lemin 1991*), with the goal of sustaining an annual harvest of 10 million cords by the year 2040." Of course, our current growth is as poor as our current stocking, so it needs no education to beat it; we just need to go away and leave the forest to heal itself. Nothing you can do to current stocking is going to improve it except time.

McMahon asked this question: "Couldn't there be incentives to get more land under the Tree-Growth (current use) tax?" Why is it that although most of the timberland owners have been on Tree Growth for decades, forest production is so poor that we are questioning sustainability? The Tree-Growth tax loads forest taxes on non-owners while getting the worst forest practices.

Responding to the Council's regular call for comment from the 22 persons present, William Voight, principal of MECRI (Maine Conservation Rights Institute) an absolutist property-rights group, called for an investment in time and computer programmers to factor in all the variables like weather, trees, labor, method, prices, and give us the answer—a touching example of faith in Bill Gates, Walt Disney, and computer modeling. Gadzik gently differed: "Things that determine sustainability are not modelable."

Perforce, a discussion by ten councilors appears disjointed, even as they go round the topic. Only a minority have an idea of the wood budget; the topic is distasteful to some, I believe. But we are moving toward understanding what happened to the North Woods. Gadzik announced that the Ban Clearcutting Referendum will be on the agenda of the next meeting, on January 22.

Only a few days following this session, the Maine Forest Service circulated the text of the Ban Clearcutting Referendum with a surprisingly thoughtful and temperate interpretation and analysis. Over Gadzik's signature, MFS listed provisions of the bill they feel need clarification, and asked recipients to comment or suggest otherwise. To me, it appears that the clearcutting initiative is precisely on time, lends itself to the sustainable forestry management debate, and, better yet, is the framework on which the Council will lay out its conclusions.

The January 22 meeting occurred too close to press time to cover it fully. However, Robert Seymour made these memorable statements to the SFM:

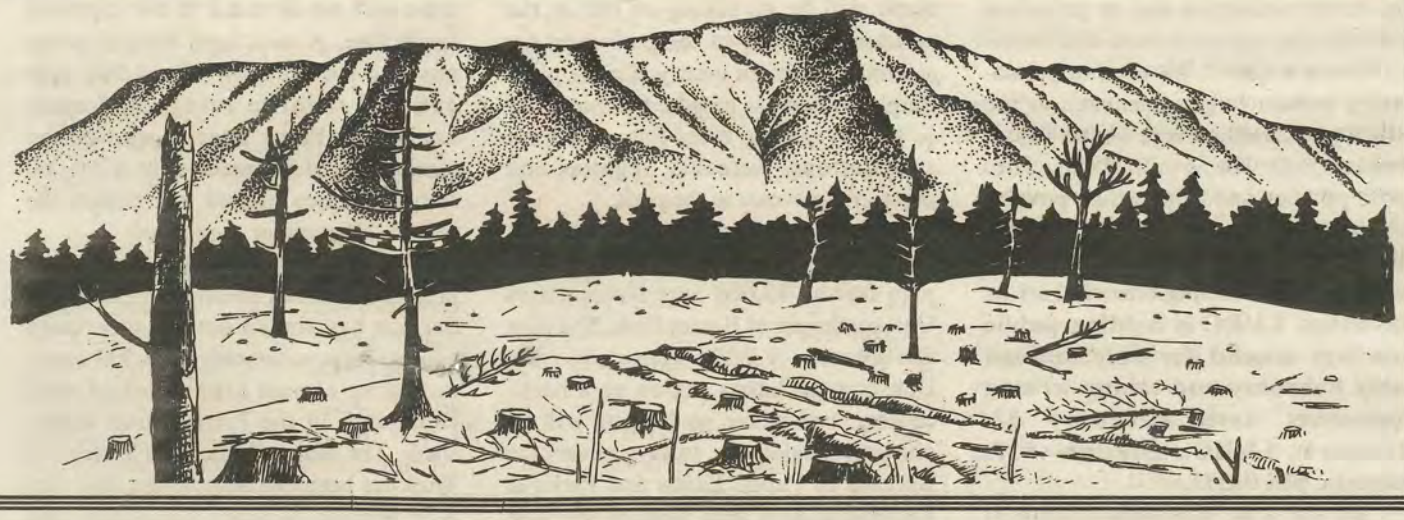
1) We have regenerated too much land over the last 15 years, and the practice continues.
2) If we are managing on a 30-year rotation, we are in trouble; if on a 100-year rotation, things look better.
3) Half a million acres are cut per year, not all regenerated.
4) Why do we need 45% of state at harvest age every year?

More next time.

The current condition of much of the Maine Woods. Photo © John McKeith.

Maine Woods Watch

by Jym St. Pierre



The Maine Woods is the greatest remaining wildland east of the Rockies. However, today this region is under siege. Maine Woods Watch is devoted to documenting the good, the bad, and the ugly affecting the Maine Woods, with an emphasis on opportunities for citizen action to protect and restore the essence of the region, its wildness.

*** Clearcut Differences of Opinion:** In the thick of one of the snowiest winters in memory, debate is already getting torrid over a citizens' initiative to ban clearcutting in the big woods half of Maine. The referendum question is expected to go before voters in Maine next fall. (Contact Ban Clearcutting, PO Box 2218, Augusta, ME 04338.) However, petition signatures had not even been submitted to the State before the issue was shaping up to be the environmental battle of the year. The forest products industry has slammed it. Conservation groups are debating whether to endorse it. The Small Woodland Owners Association is afraid it would entice woodlot owners in the other half of the state to allow cut-and-run logging. The Maine Forest Service has distributed a worst case interpretation of the referendum language. Governor Angus King has said he does not understand it, but as soon as he does he will run to the barricades to fight it. The Legislature is thinking about putting a competing question on the ballot.

Both proponents and opponents of the ban clearcutting referendum claim science is on their side. It would be great if the public dialog were on a high plane, but don't count on it. For instance, one industry forester, Si Balch of Boise Cascade, has accused referendum supporters of wanting to create "a beautiful landscape but with people who are poverty stricken...where you give a child false teeth for a graduation present because they all fell out."

Just as farfetched were statements made by Maine Public Broadcasting which aired a new *Quest* television program about the Maine Woods in early January. The station asserted that "more and more scientists say clearcutting can actually improve the diversity of plant and animal life in our forests." The statement was based on claims by Michael Coffman, a former Champion International researcher and a board member of a local property rights group. When faced with evidence that Coffman's claims have been widely discredited by reputable scientists, Maine Public Broadcasting indicated it would consider removing some of the wackiest statements when the show is sent to more than 400 schools across Maine. Major underwriter of the *Quest* series is the US Department of Agriculture.

*** Salmon First!:** Efforts are mounting by local, state and national officials to preempt federal listing of the Atlantic salmon as a "threatened" species in seven eastern Maine rivers. A new organization called Washington County First!, apparently modeled after the radical group Earth First!, has formed to fight protective listing of the salmon by lobbying and circulating anti-listing petitions. The mastermind behind the movement is Jon Reisman, an associate professor of economics and public policy at the University of Maine at Machias with extra time on his hands. Reisman insists listing the salmon will destroy the Down East agricultural, forestry and aquacultural industries.

At the state level, right after Christmas, Governor King submitted comments to the Fish & Wildlife Service and National Marine Fisheries Service arguing that Maine is developing its own salmon conservation plan which the federal agencies ought to endorse and help implement. Maine's congressional delegation has joined King in pressuring the Clinton Administration to skip the listing, despite findings by the federal agencies that the species qualifies. Senator William Cohen, who will be retiring after this year, has promised to think hard about pending reauthorization of the Endangered Species Act if the salmon is listed under the ESA. The other members of the congressional delegation may threaten even harsher action to avoid listing.

In January one more party joined the fray. The Passamaquoddy Tribe announced its support for threatened listing of the salmon. Next will be hearings and a decision on listing before next October. (Contact RESTORE: The North Woods, PO Box 440, Concord, MA 01742.)

While most attention has been on saving the seven so-called Down East salmon rivers, four others are in limbo, the Penobscot, Kennebec, and St. Croix Rivers and Tunk Stream. Those hoping for restoration of salmon runs up the Kennebec to historic spawning areas got bad news when a draft Environmental Impact Statement was issued with a recommendation to relicense, rather than remove, the Edwards Dam in Augusta. Hearings are set for February 13-14. (Contact Kennebec Coalition, 271 State Street, Augusta, ME 04330.)

Sea-run salmon are showing up in northern Maine waters. Apparently some salmon negotiated Allagash Falls last fall to gain access to the upper Allagash watershed. Meanwhile, the group Atlantic Salmon for Northern Maine has built a new hatchery in Ashland. They plan to release millions of fish into the Aroostook River.

Some say the only way there will continue to be salmon and other vanishing fish species in our rivers is by rearing them in hatcheries and releasing them into the wild. Such stocking typically diminishes the gene pools, but many anglers desperate for a chance to hook a fish support put-and-take management. During the past few years the Maine Department of Inland Fisheries & Wildlife and the Sportsman's Alliance of Maine have failed to get public funding to refurbish the state's old hatcheries. Now they have turned to the forest industry. James River, Georgia-Pacific, International Paper and Champion International have agreed to be part of an Adopt-A-Hatchery Program. Still, DIFW and SAM have not given up on public funding. They will try to get a $5 million hatchery bond issue on the 1996 ballot.

*** Industrial Park or Playground:** At a special session just after Thanksgiving, a proposal by Governor Angus King's Productivity Realization Task Force to cut state spending by $25 million sailed through the Maine Legislature. The money comes mostly from downsizing natural resource and other state agencies. One change the business-friendly King Administration tried to slip through that did not fly was to remove the "R" word from the name of the Land Use Regulation Commission.

Manufacturing accounts for about 92,000 jobs in Maine today, down from a peak of 120,000 fifteen years ago, and projections indicate a continued downward trend. Gov. Angus King wants to buck that tide. He has set a goal of adding 8,000 manufacturing jobs, including in the forest products industry, by the end of his term in 1998. However, tourism is the largest employer in Maine and the fastest growing economic activity in the world. Futurist Hermann Kahn predicts it will be the leading global activity by 2000.

Resort communities in Maine proved the point in 1995. A report by the Maine State Planning Office documents that sales were up as much as 10 percent in Bar Harbor and other tourists towns. Dann Lewis, the state's director of tourism says, "I think this clearly indicates that tourism is driving us." A new economic development strategy released in early January by the State calls for a 15% increase in tourism dollars.

As we rush toward the millennium many Maine Woods towns are searching for the winning mix of manufacturing and tourism. Southern Piscataquis County has hammered out a vision of what residents would like the region to be in ten years: a recreational mecca for the state with four-season tourism activity based on world class opportunities, and an area with a healthy, more diversified business sector.

Millinocket, acknowledging the town is at a crossroads, has started its own visioning process. Late in 1995 the Millinocket area snagged one new industry. Earthgro, a horticultural products company from Connecticut announced it would build a $2 million dollar plant in Medway to turn bark from Great Northern Paper into mulch and compost. Jim Haskell, economic development director in Millinocket, is still pushing to create a half million dollar North Maine Woods Theme Park that would feature a captive moose viewing pen.

Greenville is also looking to strengthen both manufacturing and tourism. The town needs to find an investor for a $4 million wood panel mill its wants to construct. At the same time, Greenville has grand plans for a $2 million forest/forest products visitor's orientation and conference center.

*** Gentlemen, Start Your Engines:** Everyone who knows the big woods in Maine understands that this place is special. However, the paradigm shift over the last couple of decades from wildlands to working forest has far-reaching implications. Wild forests are being transformed into intensively managed tree farms. Unbroken shorelands are being marketed in ads that scream "Maine Land Liquidation." Suburbia has wild spots down and pleading "uncle." Jet skis roar across lakes where quiet used to prevail. Roads now penetrate to nearly every remote corner. Consider the numbers: nearly 2,000 new subdivision lots and 5,000 houses and camps have been approved, 25,000 miles of private logging roads have been built, almost 200,000 acres have been parcelized without public review thanks to legal loopholes. All this in one short generation.

Even the conservative Land Use Regulation Commission is concerned. LURC's new draft Comprehensive Land Use Plan says "a strong case can be made that elements of the jurisdiction's remote character have been eroded over the last 20 years, and that development and division of land in the interior of the jurisdiction is likely having a

negative impact on ecological values and forest resources and on primitive recreational opportunities and semi-wilderness values." We need to permanently protect large areas such as the proposed 3.2 million acre Maine Woods National Park. For now, LURC ought to adopt policies and rules which prohibit development from remote areas in the heart of the Maine Wildlands and guide new growth to existing communities on the fringe. **LURC is holding public hearings around the state through early February and taking written comments until February 23. (Contact LURC, Station #22, Augusta, ME 04333.)**

By the way, the proliferation of roads throughout the Maine Woods has probably been the single most traumatic change to the region. Roads are fragmenting habitat essential for many native species, increasing motorized access to remote ponds and streams resulting in crowding and overfishing, causing water quality degradation, and destroying the most important quality of the north woods, its traditional big wildness. In fact, where there is a road, there is someone who will want to race on it. In December, drivers from the US and Canada skidded through the snow-covered 120-mile Maine Forest Rally, a two-day, high speed professional race on woods roads near Rumford. Regrettably, LURC is proposing no actions in its revised comprehensive plan to better regulate construction of logging roads or the strange uses we make of them.

*** Public Landings:** Though only about five percent of the state is in pubic ownership, people love the public lands in Maine. Unfortunately, they are so relatively scarce these areas sometimes are overloved. Acadia National Park is looking into moving some of the millions of visitors who come each year by shuttle bus. On New Year's night dozens braved -20 degree temperatures in Millinocket to get preferred summer camping reservations at Baxter State Park; hundreds more lined up outside the next morning or sent mail requests.

At its first meeting in 1996 the Baxter Park Authority adopted new policy guidelines for research that reaffirm there will be no taking of life in the sanctuary portion of the park even for scientific study. In case you were planning a wilderness parade, the Authority is also preparing rules that will limit solicitations, pageants, regattas and other group events in the park.

The Maine Bureau of Public Lands has adopted a ten year management plan for the 43,000 acre Nahmakanta Unit southwest of Baxter Park. The plan designates 9,200 acres in the Debsconeag Lakes region as a back-country area where no logging will be allowed. Incidentally, to save money the Bureaus of Public Lands and Parks & Recreation have been merged into one Bureau of Parks and Lands.

Most Mainers believe we need more protected lands. After a more than six month delay, Governor Angus King issued an executive order on January 3 establishing a land acquisition priority setting process. A new committee will identify public land needs based on deficiencies in existing conservation ownerships and public input. (Contact Maine State Planning Office, Station #38, Augusta, ME 04333.)

Two new sources of conservation funding are finally coming online. Tickets for a $1 instant "scratch and release" lottery game are on sale. Revenues, projected to be about $2 million a year, will be distributed through a new Maine Outdoor Heritage Fund for habitat conservation, public land purchase, endangered species, and wildlife law enforcement.

A new credit card issued on behalf of the State is also expected to be available soon, though there have been a few potholes. The original legislation authorizing the card mistakenly banned the bank the State wants to use as the issuing company. Also, the alliterative name Governor King suggested, Katahdin Card, is not available. While one part of state government wants to find new lands to acquire, another arm of the state wants to sell some smaller public lands to balance the current budget. Go figure.

Meanwhile, Congress is still thrashing around with the federal budget and land protection funds for 1996 are being held hostage. In any case, there will not be much in the cupboard for Maine. A new local friends group pushing for creation of a 4,500 acre national wildlife refuge at former Loring Air Force Base is worried the sanctuary will not receive the $200,000 start-up money needed to establish the refuge this summer as planned.

Still, at least one Forest Legacy project is moving ahead. The US Forest Service has signed options to acquire conservation easements on 8,500 acres, including almost nine miles of wild shoreland, in the Pierce Pond watershed. The Maine Wilderness Watershed Trust has been engineering the deal with S.D. Warren (a Sappi subsidiary) and Central Maine Power Company.

*** And Now a Word from the Wildlife:** Whoa! You have to think that's what the critters would say. We *Homo Sapiens* "harvest" them with bullets, arrows, hooks, traps, cars and trucks. We fracture, strip, dig up, dam, toxify, and build on the places they live. We put the most charismatic and imperiled into captivity. And we claim divine sanction for all this. Not to worry, Harold Borns of the University of Maine, says we are probably heading into another long-term glacial period which will rearrange the landscape mosaic again.

In the meantime, state wildlife wardens have settled a law suit by agreeing to joint custody with a hunter who found two dead bull moose with locked antlers. The state museum gets to display the unusual antlers three months a year and the hunter gets them for his den the rest of the time. Wildlife officials will also go easy and not press charges against a Parkman man who shot a protected great horned owl when it stopped by to snack on his farmyard ducks and geese. However, a South China fellow was not so lucky. Keith Childs was fined $1000 and had his hunting license pulled for several years after he was videotaped illegally hunting down several wild turkeys on a rural road with his pickup.

Last year the Legislature ordered the Department of Fish & Wildlife to come up with a plan by January for killing more coyotes. By mid-December no plan had materialized and Commissioner Bucky Owen said he has no idea what the plan would be. Most members of the Sportsman's Alliance of Maine favor a bounty on coyotes. SAM does not think kindly of wolves either. The organization has been collecting thousands of signatures against reintroduction of gray wolves to the state. What is strange is that no one is proposing reintroduction of wolves at this time.

For years hunters and anglers have helped fund wildlife programs through taxes on firearms and fishing gear. Pressure has been increasing to similarly tap nonconsumptive activities. The proposed Fish & Wildlife Diversity Funding (AKA Teaming With Wildlife) Initiative would tax hiking, camping and other outdoor equipment to provide funding for nongame and endangered species programs. (Contact Maine Audubon Society, PO Box 6009, Falmouth, ME 04105.)

Endangered species. Sadly, those have become fighting words. Some people do not value the diversity of life that conservationists want to preserve. Several new reports present interesting facts. The Global Biodiversity Assessment estimates more than 30,000 species are facing extinction. In the US, 99 percent of all species listed under the Endangered Species Act continue to exist. The Interior Department says this shows the ESA has kept hundreds of species from becoming history. The problem is hundreds, maybe thousands, more qualify for listing but are being ignored. The Nature Conservancy says one-third of the 20,481 native American plants and animals it has studied are vulnerable to extinction. According to the *New York Times* the good news included discovery of an expanded range for the rare banded bog skimmer dragonfly found for the first time in Maine last year.

A few species already on the endangered list, including golden and bald eagles, may get a reprieve from a proposed massive windpower project in western Maine. Kenetech Corp, which wants to erect a 639-tower windfarm in the Boundary Mountains, is in serious trouble. In recent months failed turbine blades and generators have forced Kenetech to shut down windmills elsewhere, stock prices have crashed, the company's chief executive and other top managers have resigned, and staff have been laid off, including Northeast director, Chris Herter of Falmouth. Kenetech is likely to be sold and its Maine project mothballed.

*** Pass the Kleenex:** In December, an agreement by Kimberly-Clark Corp. to sell Scott Paper Company's facial tissue and baby wipes businesses settled Justice Department antitrust concerns about a merger of the firms. As part of the $9.4 billion acquisition of Scott, K-C will cut 6,000 jobs immediately, 2,000 more by next year, and sell up to a dozen plants. Scott's mill in Winslow will be spared. In fact, Kimberly-Clark ran full-page ads in local newspapers the day after the merger became official promising environmental stewardship and community commitment. A week later K-C announced a $25,000 donation to the United Way of Mid-Maine.

"Chainsaw Al" Dunlap, who saved Scott Paper by dismantling it, got decidedly less flattering press in a January 15

Clearcut near Wilsons Mills, Maine. Is this the legacy we want to leave our children? Photo © John McKeith

Business Week cover story entitled "The Shredder." An excerpt: "Dunlap bristles at the notion that a business should be run for such stakeholders as employees and communities. 'Stakeholders are total rubbish,' he says." Dunlap is looking for a new company to salvage by dismemberment. Maybe he will take over Kenetech.

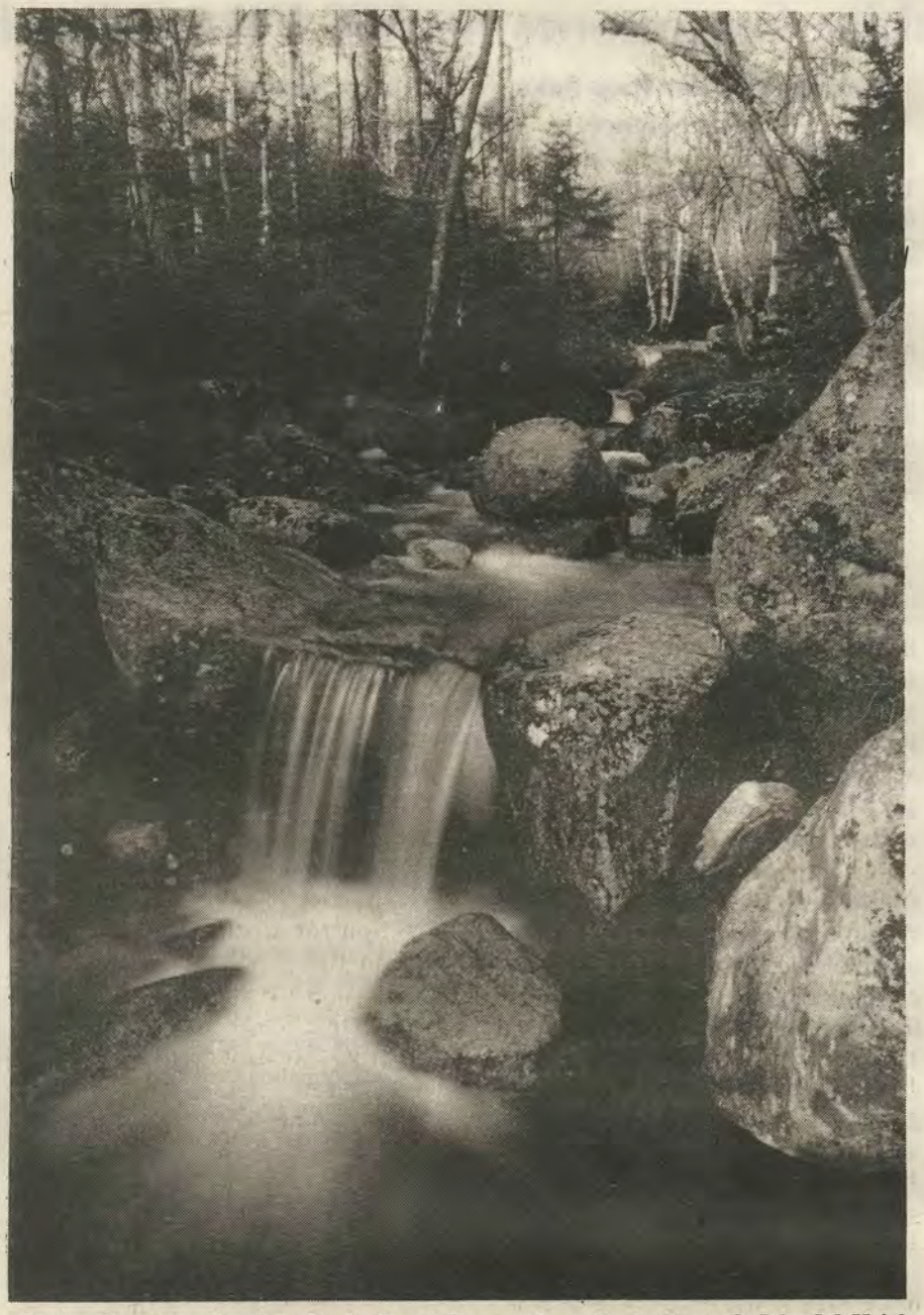
A number of forest products companies are establishing local partnerships. Pride Mfg. and Moosehead Mfg. have pledged funding to help the forestry program at Foxcroft Academy in Dover-Foxcroft purchase new computer equipment. Bowater has been discussing "ideas that would be mutually beneficial to the paper company and local schools" in Millinocket, East Millinocket and Greenville. Madison Paper is supporting a proposed pulp-and-paper curriculum at the Madison Area High School to begin training workers for highly skilled jobs in the industry. International Paper has donated $400 for training of Emergency Medical Technicians at Dean Hospital in Greenville. The contribution did not put much of a dent in IP's record earnings for 1995 which topped $1 billion. To celebrate IP announced it would cut 1,300 jobs from its worldwide workforce to improve efficiency for 1996.

The partnership between Champion International and the town of Bucksport strained to the breaking point in early December when the company appealed a decision denying a tax abatement for its mill. Finally, after more than three years of arguing, a settlement was announced at the beginning of January. The company will get $247,000 back in return for dropping challenges that sought $6 million for 1992-95 abatements. Bucksport spent close to a million dollars defending its assessments of the papermill, but locals are happy just to end the dispute.

After years of losses and divestitures Boise Cascade is in a buying mood. For example, the company is investing in a joint venture to build an oriented strand board plant in Ontario. Closer to home, Boise Cascade Office Products, a mostly owned subsidiary of Boise Cascade Corp., is buying the wholesale business of Loring Short & Harmon. Loring, a family company that has been in the paper products business for 130 years in Maine, has closed eight retail stores and will sell three others in Maine and New Hampshire to Boise. Boise has also been doing a great job as an exhibitionist. The American Pulpwood Association gave Boise's "Exhibitionists Committee" its 1995 award for the company's pro-forestry activism in Maine.

*** Scissors, Paper, Stone:** We have seen the boom. Prepare for the bust—in paper prices and profits, that is. Following a five-year slump, pulp and papermakers have been enjoying stratospheric prices for their products and profits at unprecedented levels over the past year and a half. However, as suddenly as it came, the boom may be going. Forest industry analysts were predicting the upturn would last at least through 1996, but many companies recently warned that 1995 fourth quarter results would not meet expectations. According to the *Wall Street Journal* analysts now say profits will dive this year, though they disagree whether it will be a mild or wild drop.

Pulp and paper price shifts could have a major effect on Maine's 16 major papermills. Expansions planned at several mills could be stalled if the price drop is more than a short adjustment for the notoriously cyclical paper industry. Prices for recycled paper products have been particularly volatile. Old newsprint, for instance, has fallen from $220 to $45 per ton. That is good news for recycling mills in Maine run by Bowater and Stone & Webster, but bad news for paper recycling businesses.



Spring Brook leading into Basin Pond, Baxter State Park. Photo © John McKeith

So far prices for new newsprint have stayed high. In fact, they are so high many newspapers, including the **Bangor Daily, Lewiston Sun-Journal, Portland Press Herald, and Maine Sunday Telegram** are cutting jobs. But another announced 10 percent price hike in newsprint is not likely to stick since publishers are balking and the US Justice Department is looking into possible anti-competitive pricing practices.

Exports and imports of forest products were in the news too. Pulp and paper exports for the first nine months of 1995 jumped 56 percent to $290 million. Members of Maine's congressional delegation are supporting emergency legislation that would impose a 25 percent duty on Canadian lumber shipments. Until legislation is enacted, they are pushing US trade officials to levy an import tariff on softwood lumber the industry claims is subsidized by the Canadian government.

One new Maine company is more interested in lumber made of plastic than softwood. Conversion Products moved from New Hampshire to Saco to produce its benches, picnic tables and other items made with recycled plastic lumber.

Speakng of plastic, James River Corp. has agreed to acquire the plastic cutlery and thermoforming operations of Benchmark Corp. of Delaware to form the second largest producer of plastic foam cups in the United States.

*** Making Stumps:** How much land is needed to grow trees for Maine's paper industry? State Conservation Commissioner Ron Lovaglio answered that at a recent meeting of the Maine Council on Sustainable Forest Management. He said industry needs 12 million of the 17 million acres of forestland in Maine to supply the six million cords of fiber used each year. Arithmetic suggests that leaves 5 million acres for other purposes, like perhaps a 3.2-million acre Maine Woods National Park.

Cutting all those trees is still a dangerous job. Logging is the leading cause of on-the-job death in Maine accounting for 25 percent of all work-related deaths in 1995. Moreover, the logging injury rate is the second highest in the workplace. New voluntary training programs are reaching some of the 3,000 to 4,000 woodsworkers in the state, but the large landowners do not want to be required to hire only loggers who have professional certification.

Speaking of unprofessional conduct, the tradition of taking others' trees may become less lucrative. In November, Gerald Nelson, a logger from Freedom, was named by a Kennebec County grand jury in a criminal indictment on multiple timber theft counts. In Somerset County, a landowner has filed a civil suit seeking $1.2 million from a Guilford wood cutter. In the Southwest, timber rustling is so widespread locals joke it has gotten hard to see the forest for the thieves.

Preliminary results from the much delayed forest census suggest it is getting hard to see some kinds of trees in parts of Maine, too. For instance, marketable stocks of several species fell notably since the early 1980s in Penobscot County: spruce is down 25%, fir is down 18%, hemlock is down 12%.

The American Forest & Paper Association's Sustainability Forestry Initiative (SFI) went into effect New Year's day. SFI, in the planning for three years, is a set of watered-down guidelines that companies are supposed to voluntarily meet. In a surprisingly candid editorial in December the *Northern Logger* admitted that the program is really "the Sustainable Forest *Industry* Initiative. Whatever side benefits are gleaned from a forest products industry promise to begin paying closer attention to 'sustainable forestry' after January 1 the goal of SFI is to create a public relations environment free from the threat of crippling legislation and other forms of public backlash in the coming years and decades." In other words, the Sustainable Forestry Initiative is about reforming the industry's public image, not its practices.

*** Folks in the News:** Hank Tyler of Hallowell has been elected president of the national Natural Areas Association. Dave Field of Hampden has been named chair of the national Appalachian Trail Conference. Sherry Huber, former legislator and gubernatorial candidate, is the new executive director of the Maine Tree Foundation, a "nonprofit group sponsoring environmental programs that promote sensible forest use."

Ted Johnston of Fayette, former executive director of the Maine Forest Products Council and lobbyist for US Rep. Jim Longley, has picked up a new client. Wells selectmen have agreed to pay Johnston handsomely to pressure the Department of Environmental Protection to reverse its denial of dredging of the town's sandy harbor. In case DEP is recalcitrant Johnston is drafting a law and preparing to use his legislative connections to get the project exempted from DEP review.

Steve Schley of Brewer, head of the largest nonindustrial forest ownership in Maine and chair of the Maine Forest Products Council, got a footnote in the newspaper for contributing to the 1998 reelection campaign of US Sen. Robert Packwood. Packwood (pronounced PACwood), R-Oregon, a powerful friend of the forest industry, resigned from the Senate last fall in an ethics scandal. No word on whether he returned Schley's money.

George Smith of Mt. Vernon, executive director of the Sportsman's Alliance of Maine (SAM), was the recipient at Christmas of a lawsuit by eleven former SAM board members who charge Smith with incompetence. They want Smith out of SAM. SAM is the affiliate in Maine of the National Riffle Association which just got its first woman president. Marion Hammer, a hard-liner, moved to the top of the pile when former president Thomas [illegible] died from a heart attack in November while deer hunting.

Jym St. Pierre, RESTORE: The North Woods, 7 North Chestnut Street, Augusta, ME 04330, (207) 626-5635.

A Sampling of Public Comments on VT FRAC Draft Interim Report

Vermont's Forest Resource Advisory Council, having collected public comment on its draft interim report to the legislature, is now charting its work ahead, scheduled for completion by June 1996. If FRAC is to follow the weight of opinion and forge broadly supported forest policy, it will have to make some decisions about the divergence of views expressed and map a policy direction that affirms the purpose of government.

What follows is a selection of comments that frame the choice FRAC must make between those who oppose and those who support concerted action. We hope they shed some light on the kind of policy process citizens would like to participate in: something that arrives at a meaningful direction, that promises to carry dialogue forward as positive steps are achieved.

We also hope that these comments illustrate our own sense of this dialogue as being one of a circle of views rather than a necessarily dichotomous argument. Inevitably, some people will attempt to filibuster. Our question is: do events and reality support this attempt at filibuster, or a more broadly supported consensus that Vermont must get to work on a comprehensive forest policy?

If FRAC's December meeting was any indication of the Council's willingness to address issues in a manner that reflects the public's sense of urgency, proponents of a Vermont Forest Practices omnibus bill will either have to work legislatively or continue to pressure FRAC itself and break the apparent control exercised over its agenda by three or four industry lobbyists. At the December meeting, FRAC discussed, but did not move on, Chair Darby Bradley's proposal for an interim permitting of clearcuts; by its failure, as one FRAC member noted, the body runs the risk of losing credibility and being over-taken by legislation. It is possible that industry lobbyists would indeed favor a legislative struggle wherein they could play the pro-business card that has, for instance, won special dispensation for the ski industry in water withdrawal for snow-making. The question is, does anyone really benefit from a reluctance to abandon dogma and self-interest? How long do we wish a few individuals representing a narrowly-defined segment of the industry interfere with the work that needs doing to ensure a forested future for Vermont ?

—Andrew Whittaker

Silviculture Drives Clearcutting Public Bamboozled

"Many non-farmers or environmentalists have never lived close to the soil and are swayed by mass media and leaders who do not know or disclose truthful statements. Hence they classify as clearcutting the harvesting of a variety of species growing together at one time even when marked for cutting by a forester for different reasons such as maturity, diseased and dying, stagnant in growth or dominating smaller trees of higher value which could grow faster if released. The Council must not be swayed by such persons."

—Ray I. Pestle, Jr.
Trustee Emeritus, Woodland Owners Assoc., Brattleboro

Opposes Regs for Regs Sake, Supports Science

"In my opinion, the fiasco of the 1995 legislative session proved that there will be parties who will ignore science, and data, and fact, if it does not meet with their agendas. They will more and more likely make themselves apparent during this period of comment. Vermont cannot afford regulation for the sake of regulation."

—Roberta Borland, Greensboro Bend

Supports Clearcutting & Herbicides; AMPs Are Working—Double Entry

"Clearcutting and herbicide spraying should be supported as legitimate silvicultural tools that are sometimes necessary to conduct sound forestry. FRAC should resist the temptation to overreact to isolated concerns and promote unnecessary and unduly burdensome restrictions of these activities.

"Acceptable Management Practices (AMPs) are working extremely well and should not be tampered with. We are aware of countless examples where the current process of industry working together with the Department of Forests, Parks and Recreation and the Division of Water Quality to address and resolve problems that arise works well. In the very few instances where a satisfactory resolution has not been found through the joint industry/government compliance process, current law is more than adequate to handle the situation. We simply do not need additional AMP regulation."

—Theodore Jewett, Columbia Forest Products, Newport

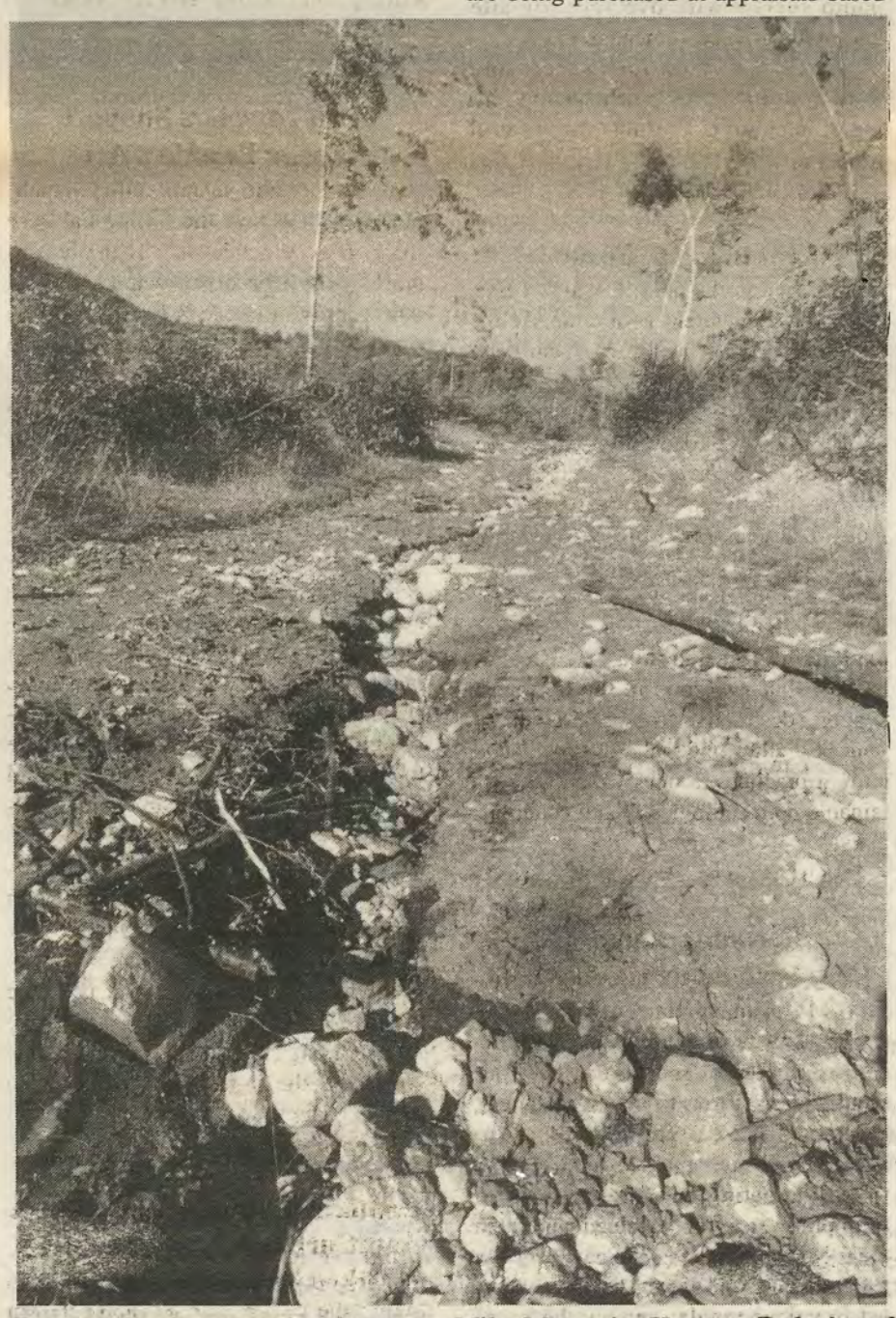
[Note: These exact same comments were submitted in separate, duplicate letters by four parties connected with the Eagle Lumber Company of Stamford. They also observed that, "We have participated in the FRAC process and supported it on the premise and the presumption that there will be no regulatory impacts associated with this group's work. That means no additional regulation and no further regulatory burden placed on the forest products economy."]

Public Acquisition Contributes To Forest Fragmentation

"Some of the recommendations are not constructive. You need to be very specific. Do not leave it up to our lawmakers to come up with their own ideas."

"[Public acquisition] is a critical issue as it is the State and Federal governments [which] are competitors with the private sector for the resource base. Public Acquisition is raising land values causing more pressure to dispose and fragment forest lands. Public funds are drying up for land management yet lands are still being purchased with scarce funds. Un-threatened forest lands are being purchased at appraisals based on other public purchases creating unsustainable market Values for long-term private forest investment."

—Jonathan Wood, Bell-Gates Lumber Corporation, Jeffersonville



Erosion following a massive clearcut on Miles Mountain, Vermont. Defenders of the status quo in Vermont say regulations on clearcuts aren't necessary because industry is doing a good job of voluntary compliance with acceptable management practices. Photo © John McKeith

What the People Want

"There are many individuals who are just as concerned about the issues as I am. I believe that if Vermonters begin to see their state legislature take action more people will begin to speak out in favor of change. However, Vermonters don't want to see an apathetic legislature play politics as usual. It's time to stop playing politics and do the right thing. It's what the people want."

—Seth Coffey, Burlington

Woodsworker Looks to Future

"Forest liquidation is happening in Vermont now and will continue to grow as forest product industries look east to fill their needs. I am in no way against forestry in Vermont however it must be done in a way that is beneficial to all. Forest liquidation as you know is not beneficial to the ecosystem, loggers, or future generations. Forest liquidation is only beneficial to the person out for the quick buck. I encourage you to get the FRAC board back together and this time address the issue in a positive progressive manner."

—Dylan Monahan, Danby

Liquidation Is a Crime Even if Undefined by FRAC

"Upon reading the draft, I was astonished to discover that the Council did not once address the issue of forest liquidation. This is extraordinary, since public dismay over accelerating forest liquidation is precisely what spurred the Legislature to reactivate the Council and to ask it to examine threats to the health of Vermont's forests . . . .Yet the Council also notes that it has not even been able to define "liquidation." It is essential that FRAC confront forest liquidation and recommend ways to put an end to it. Even though most forest owners aren't engaged in the practice, it is still a crime against posterity and must not be ignored."

—Richard Andrews, Chester

Increase Value Added & Water Quality Protection

"First, I must confess some discomfort with the generality of some of the recommendations in the report. Motherhood and apple pie will not do. FRAC did indicate that there will be additional recommendations so I may be premature in my comments but if we are trying to increase the number of jobs in the forest products industry we must increase the number of opportunities to increase the value of the products we produce. The shipping of raw logs from the state should be discouraged or to state it positively producers should be encouraged to develop markets and produce finished items.

"The protection of water quality on all forest harvesting operations is a critical goal. I believe that the banks of lakes and streams must be buffered. Undisturbed vegetation is one solution but better yet is well trained (educated) and sensitive loggers is another and if you have both conditions things will

improve."
—Pete Richardson, Norwich

Public Supports Stewardship No Herbicides, Please

"I understand that we are in hard economic times and budgets are being cut. However, I think it is very important that we steward our forests to this degree. It is quite simple. If we take these steps to take care of our forests the forests are only going to take care of us as well. You may say, well, people aren't going to like these rules and regulations. I will tell you most people are willing to sacrifice as long as everyone is contributing and I think you will find that the majority of the people of this great state will bend to help preserve the integrity of our forestlands.. . . ."

". . . . I want to convey to you the importance of stopping aerial herbicide spraying. We are a small state and we do not need another industrial detriment as this to take place on our lands. [I]. . . feel very strongly that herbicides do not belong in our . . . forest. They will tell you that it is the most economic way to produce forest products . . . The fact is they have over-harvested and are using herbiciding as the answer."
—Sherry Belknap, Selectman, Town of Bloomfield, Essex County

Against Herbicides

"I recommend legislation to prevent herbicide use as a forestry practice on large tracts of clearcuts because of serious questions about the effects on the following: 1. young fish, especially trout and salmon 2. soil quality for subsequent forest growth and forest sustainability 3. water quality 4. ability of animals to breed and reproduce normally 5. the diversity of birds and their ability to control insects, and indirectly, some plant diseases 6. human health and domestic or farm animal health.

"Herbicides do not contribute to long term sustainability, nor do they contribute to the protection of wetlands."
—Sylvia Knight, Charlotte

Eleven Year Olds Concerned & Offer Common Sense

[Students in Mr. Otto Wurzburg's 6th grade class in St. Johnsbury have been studying the northern forest and took the time to write FRAC on their concerns. Here are a few excerpts from their often eloquent letters.]

"I'm concerned about the wildlife of the Northern Forest, from the biggest bears to the smallest ladybugs. I'm also concerned about the trees because they make the air clean and purify the water. Clearcutting is so ugly. Herbicides are also ugly, just in a different way."
—Ben Boye

"I am concerned about the northern forest. My family and I own about 60 acres of woodland. I have heard about and seen too much destruction of the forest, some of which I have seen right near home."
—Julian T. Gerardi

"Here are some solutions that might help the Northern Forest: 1.) Stop clearcutting 2.)Stop highgrading 3.) Stop herbicides 4.)expand forest service program 5.)stop forest liquidation 6.)reduce log and wood exports."
—Kaitlin Gingue

Unique Proposal for Field Monitoring

[The following commentator had a 9 plank platform for forest policy. We liked all of them but found #4 unique:]

"4. Monitoring of Forests by: high school forestry students followed and enhanced by college forestry students reporting to District State Foresters who correlate information on computer program with frequently updated aerial photo survey with overlays, on site inspection and recommendations.

5. Cost of monitoring cuts and forestry practices to be achieved by: filing of intent to cut permits; payment of timber tax."
—Lloyd Gierke, Brunswick

Threat to Local Economy

"Although the area in which I live is heavily dependent economically on the forest products industry, local people are opposed to clearcutting and other destructive forestry practices, including and particularly the use of herbicides. We have finally recognized that the profits of the forest products industry are not a measure of the viability of our local economy. Once every tree has been cut, international corporations will simply move on to another exploitable forested area. . . .Do not believe that everyone in the northeast supports destructive forestry. We will be your best allies in a real effort to change current practices to ones which are sustainable both ecologically and economically."
—Daisy Goodman, Brunswick

Herbalist Supports Ban on Timber Speculation

"My primary concern is to make timber speculation on private land an impossibility in the state of VT. It would be disastrous to the environment, economy, and culture of Vermont to have out of state investors and corporations liquidating our forests for short term profits, leaving devalued land, with clear cuts to stay here. We cannot allow this to happen, it should be against forest practices regulations and be made extremely unprofitable.

"I am a small business owner . . . My business is directly linked to the health of the environment in Vermont. We cannot sell VT products when the image of VT is of clear cuts and timber speculation. Small businesses like my own are an essential part of the future economic health of the state and should be seriously considered. On a less theoretical level, my business and livelihood are directly linked to the health of VT forests. Many of the products I produce have as their base sustainably harvested wild plants from family land in Andover, VT."
—Laura Batcha, Putney

Two Foresters Support Forest Practices Act

"We see the sustainability benchmarks as building the biological case for a forest practices act. If the benchmarks are to be clean water, a forest where growth exceeds harvest, where we have diverse ecosystems and the diversity of aquatic insects that is indicative of clean water, and the means of achieving this is through the AMPs, maintaining wetlands, and protecting riparian zones, then it would seem logical to incorporate these into a forest practices act. . . . The forest practices act should set standards for forest management . . . .If sustainability of forestland and the various ecosystems that make up forestland is a goal, then some standards have to be set. You are identifying the standards, but again they have to be implemented and enforced, and we do not see how this can be done outside of a forest practices act. Thirty percent of the non-industrial private forestland is under forest management with current use, but that still leaves 70%, or about 2.3 million acres, which are not following any standards. That is where the majority of the liquidation cuts, the high-grading, the sell-off and subdivision, and the destruction of wildlife habitat occurs."
—Don and Nina Huffer, Chester

Combine Equitable Taxation & Curbs on Liquidation

"However, merely revising taxes to match the occurrence of income from timber operations does not assure that liquidations will not occur anyway. Thus the call for regulations to preclude practices which degrade or liquidate forest resources reflects a valid public concern. These two concerns can be addressed through taxation based upon the value of the timber cut, at a rate based upon the quality of the harvest operation performed. In this way, good forestry, which protects habitat, water quality, soils, and forest productivity would be rewarded by a lower rate of taxation, while poorer quality work would be penalized through higher tax rates."
—Lowell Krassner, Burlington

Reporting AMP Violations; Cutting on Public Land

[The writer reported water quality violations on a log job to the Department of Forests and Parks and was later harassed by the landowner]:

"Later the landowner called me, screamed obscenities and made a threat which I reported to the state police. For an entire summer, whenever he or his relatives drove by my house they would shout, blow the horn, and several times yelled, "we're watching you." That's some enforcement system."

"You mention that you are interested in assessing the public's perceptions of scenic quality. I was thinking of this today while looking at the stark, huge, rectangular clearcut on the western flanks of Mt. Abraham (GMNF land). It's several years old and still looking awful. Lewis Creek Wildlife Management Area in Starksboro has been extensively cut to make a grouse factory for hunters. Its appearance too is dismal. With these examples on public land, is it any wonder that private landowners are overcutting?"
—Betina Matteson, Bristol

A Maine Perspective

"I challenge this council to fly over those areas of Maine and see if you don't come back to life in Vermont glad you have the chance to do something just like Scrooge was glad he was alive on Christmas morning. I also ask you to get the book "Beyond the Beauty Strip" by Mitch Lansky, which documents the liquidation of Maine's forests. . . ."

"As a spirit of Maine's Present and Vermont's Future, I say 'You still have a chance to decide what future you want.'"
—Art Shea , Bristol, VT

VT Citizens' Forest Roundtable Sponsors Public Hearing on Herbicides

Public Says No to Aerial Herbicide Spray by Paper Companies in VT

by Andrew Whittaker

About 50 people turned out for the Herbicide Forum on December 19 in Island Pond. This meeting was the first formal event organized by the Vermont Citizens' Forest Roundtable. What follows is a brief summary of what speakers had to say.

Among those attending were four representatives of Champion International, the only one of Essex County's three major landowners to attend. Moderator of the forum, Brendan Whittaker, noted that Champion had come "with a story to tell and a position to take" and that this meeting was intended as a "forum not a debate."

Champion International's Bud Delano of the West Stewartstown office noted the need for further dialogue on the subject of aerial herbicide application and stated that he thought Vermont's Forest Resource Advisory Council was the proper arena for such a discussion. "Let the issue unfold without duress," he urged. (Two members of FRAC attended the meeting; Chair Darby Bradley and Eric Palola, of the National Wildlife Federation).

In the course of a fifteen minute presentation on Champion's approach to silviculture which led off the meeting, Delano stated Champion's mission is: "To provide our customers with the highest value products and services in a manner that balances environmental and public interests with Champion's economic objectives." He also noted that Champion's management vision requires the support of the public and that, therefore, outreach to the public is a prime objective for the company.

Key to Champion's economic objectives is the production of cordwood for paper mills in Bucksport, ME and Deferiet, NY. Delano presented a graph showing an anticipated "softwood gap" emerging in 2010 and continuing until 2040. Because of this gap, Champion has curtailed sales of fiber from its own lands and wishes to accelerate growth of softwood through the use of herbicides. Part of the "gap" dynamic, said Delano, was excess or "opportunistic" mill capacity structured around a glut of softwood fiber following the post-budworm salvage cutting of the 70s and 80s.

Delano also noted that Champion is pursuing the "triad" management schema of Hunter-Seymour; i.e., some lands are designated for intensive management entailing the use of herbicides and manual release, others are reserved for lighter management, some non-strategic lands are not managed at all and form the basis of Champion's plans for conserving biodiversity.

Why Locals Oppose Herbicide

Several presenters followed Delano and Champion to give a summary of how the herbicide issue came to the fore in Vermont over the past months. Lloyd Gierke of Brunswick whose land abuts the proposed Boise Cascade spray site and is a retired timber contractor who once worked on Champion lands, told of how, after the spray permit was issued without public input, he approached various people involved in the permitting decision including the Commissioner of Agriculture. Gierke lamented the Commissioner's being point person in the matter, forestry having "no similarity to growing corn." Department of Ag officials, said Gierke, said the remoteness of the Brunswick spray site was a factor in their seeing "no problem" with Boise's proposal.

Gierke also addressed the question of erosion and sedimentation. Although he does tend to believe information on the relative safety of glyphosate, he does have reservations about the inerts and surfactants used in the herbicide. Citing water quality assessments that have noted sedimentation in the Nulhegan which drains much of central Essex County's corporate lands, he said the water in the river is often "too thick to drink and too thin to plow" and that logging and clearcutting are the culprits. Given the numbers of Bloomfield kids who swim in the river and inevitably ingest water, and given the incidence of runoff into the river, Gierke believes contamination of the watershed is a justifiably feared outcome of spraying.

Gierke also criticized the AF & P's Sustainability Initiative's position on herbicides, which urges the "prudent" use of forest chemicals: "I didn't know there was such a thing." He concluded by observing the "great need for communication" and hoping for consensus between citizens and Champion.

Daisy Goodman from Brunswick, Vermont and Stratford, New Hampshire gave a rundown on the spray situation in New Hampshire where Champion has an ongoing program in the Pittsburg area and Boise sprayed in Stratford over community objection. Daisy noted that the New Hampshire legislature has removed the local option to control spraying.

Goodman also raised questions about drift potential with even minor crosswinds, given the minute size of spray droplets. She also noted problems with the toxicology studies of glyphosate that have led to its benign reputation.

Andrew Whittaker offered his opinion that citizens can and should play an active role in the setting of standards for silviculture. He noted there are "ecologic, silvicultural and political" aspects to the matter, and that communities and citizens should not shy away from participating actively in the political decision on whether to allow herbicide treatment of large cuts. He also noted that the policy matter is now in the hands of the Forest Resource Advisory Council and the Vermont Pesticide Advisory Council (VPAC). *[As we go to press, FRAC has organized a three person investigation team that will be gathering expert and public testimony on herbicide spraying.]*

Wetlands, Soils and Planetary Physiology

Jeff Parsons, a citizen representative on VPAC and a biology teacher at Sterling and Johnson, said that VPAC will be actively involved in the spray issue. He noted that Vermont has had a policy of pesticide reduction since the Kunin administration and that extension of herbicides into forestry would be counter to this policy.

Thanking Champion for the opportunity to recreate and botanize on its Yellow Bog lands, Jeff went on to list reasons why he does not favor introduction of herbicides into that area. 1) Wetlands are everywhere—proper buffer areas would preclude spraying; 2) The bog-forming aspect of the ecosystem is unique; 3) Preserving ecosystems means conserving ecosystem processes such as natural regeneration; 4) Rare plants such as the mountain cranberry; 5) Glyphosate toxicity irrespective of the LD 50 level; 6) The presence of the state's largest deeryard in the Nulhegan Basin; 7) Impacts on forage for deer, moose and the rare spruce grouse; 8) The laboratory evaluation of chemicals which mis-evaluate their leaching potential in the field; 9) pH and soil temperature considerations.

Richard Alexander of Craftsbury addressed forest soils, "the placenta that grows the forest." Plant communities, he said, respond to disturbance to protect soil. A Hubbard Brook study of 1969 on the effects of herbiciding after clearcutting identified nitrogen deprivation as one response; herbiciding also interrupts the ability of soils to fix carbon. Richard also noted that management for pulp in monoculture simplifies the genetic diversity that has evolved over eons. Non-timber sources of pulp should be developed and the most productive forestlands left to evolve as forests. Citizens, he concluded, must assert ecosystem values.

Barbara Alexander also of Craftsbury applauded the citizen outcry over herbicides. She noted that glyphosate is a broad spectrum non-selective herbicide designed to eliminate pioneer species. Inerts in Accord, the surfactant that helps the chemical penetrate the waxy cuticle of leaves, are of unknown risk, are not inert and not subject to toxicity evaluation. Residual breakdown products are also unknown, and most labs are not equipped to test under field conditions. There is a "near monopoly" on such information and Monsanto which produces Accord does its own testing. Barbara stated three concerns: 1) How can we spray without a firm factual basis of how Accord behaves in the environment? 2) Industry must show a commitment to the forest, ecology, water, diversity and human communities. 3) Informed consent or veto is a public right; alternatives to herbicides can be found.

Penelope Newcomb of East Charleston said that although not comfortable with what Champion had said, she appreciated their words about stewardship. Our lives depend on a natural, living, alive planet; all creatures, minerals and everything on the planet is alive. The dominant cultural paradigm doesn't recognize that all creatures are part of a web of life and that these species have purpose beyond their roles as resources for humans. What is the role of herbicide-targeted species?

Penelope also said we are all facing an economic crunch and must reclaim past forms of knowledge. Understanding principles of survival underlies stewardship and sustainability. Cyclical ways of living must be developed; we bankrupt ourselves if we make no return to the Earth. In the case of herbicides, we must recognize the interrelationship of all plants.

Nova Kim of Glover said that what is a weed to some is life and medicine to others. The future generations must be respected: "Look behind you, you will see seven generations rising." "How can dollar-value be put on any life?" A holistic view requires approaching the entire system; filling a softwood gap is too narrow a notion. The Northern Forest is one of the lungs of the world. "It is not your right to manage your mother."

Kevin Coffey, a board member of Northeast Kingdom Trout Unlimited, stated concerns about the toxicity of glyphosate to salmon and rainbow trout fry and the toxicity of the surfactant which, he said, is 70 times as toxic as glyphosate itself. In some cases, glyphosate residues have been detected

Herbicide Project Organizes to Stop Spraying in New Hampshire's Forests

by Daisy Goodman

In the Connecticut River headwaters area with its numerous springs, wetlands, small streams and tributaries, protecting water quality from contamination by herbicides means eliminating the use of herbicides.

Aerial application of defoliant herbicides has been used in forestry "management" on the New Hampshire side of the Connecticut River for roughly a decade, primarily in the far northern part of the state (Connecticut Lakes area). According to Murray McKay, head of the NH Division of Pesticide Control, Boise Cascade Corporation was responsible for spraying until 1994. In 1995, Champion International began spraying, and Boise stopped.

Legally, companies wishing to spray must apply to the Division of Pesticide Control, submitting product information including results of EPA testing of active ingredients. Testing of surfactants and other so-called inert ingredients is not required. Champion is currently using the Monsanto product Accord, containing glyphosate and undisclosed inert ingredients, which is mixed before application with the surfactant Entry II. Both glyphosate and ethoxylated tallow amine, the principal functioning agent of Entry II, are classified "moderately toxic", and are listed as hazardous chemicals by OSHA.

Glyphosate functions by interfering with a certain cycle of a plant's metabolic system. When it is sprayed at a specific time during the life cycle of deciduous plants, they lose their leaves and will not overwinter. Theoretically, softwood species are not vulnerable when sprayed at this time. In addition to herbicidal effects, studies show that both glyphosate and ethoxylated tallow amine are toxic to fish, mammals and aquatic insects *(Monsanto, Material safety data: ENTRY II Surfactant; Cox, Carolyn. Glyphosate, Part 1: Toxicology . Journal of Pesticide Reform, Vol. 15, No. 3, pp 14-20).*

Although regulating agencies require testing only for so-called "active" ingredients, certain "inert" surfactants, including that present in ENTRY II, appear to be more toxic to aquatic ecosystems than glyphosate itself. In addition, composite effects of chemical mixtures can have unexpected effects (Cox, loc. cit.). Companies using herbicide products claim that no-spray buffer zones protect water quality; however even relatively low wind velocities can result in application of herbicides far away from target areas. Groundwater run-off also carries toxic residues. In the Connecticut River headwaters area with its numerous springs, wetlands, small streams and tributaries, protecting water quality from contamination by herbicides means eliminating the use of herbicides.

Both Boise and Champion use glyphosate to kill hardwood saplings and other brush in clearcut areas, claiming that the "release" of softwoods from competition by brush is essential to provide faster growing, marketable spruce and fir. As Mitch Lansky points out in **Beyond the Beauty Strip**, herbicide use, regardless of its environmental toxicity, is an unacceptable method of forest management because it reduces regenerating mixed-wood stands to monoculture softwood stands. Defoliant chemicals have severe affects on the entire forest—by eliminating certain elements of the ecosystem and damaging others, the forest is fundamentally changed. To cite one of Lansky's numerous examples, ground surface temperature in a softwood stand that has been sprayed is significantly higher, and the ground is significantly drier, than in an area where brush has been allowed to grow (cf: Lansky, Mitch. **Beyond the Beauty Strip**. Tilbury House: Gardiner, Me. 1992. pp 178-203).

Despite company propaganda, local communities remain unconvinced that herbicide use, especially aerial application of herbicides, has a benign effect on the environment or neighboring human communities. Until recently, the timber industry has ignored public discomfort with herbicide spraying. However, in northern New Hampshire and Vermont use of herbicides in forest management has become increasingly controversial over the past few years.

In 1993 Boise Cascade sprayed glyphosate on clearcut land in the town of Stratford, also in the northern part of the state *(See "NH Landowners Alliance: Untainted Drinking Water is Not a 'Property Right' in New Hampshire"* **Forum**, *Winter Solstice 1993, vol. 2 #2, page 31).* Unlike spray areas located in the Connecticut Lakes region, Stratford has a year round human population. Only the immediate neighbors to the spray area were notified of Boise's plans, despite the fact that aerial application of pesticides can result in chemical drift of up to several miles, depending on wind velocity and size of the spray droplets.

Residents were furious, organizing an overnight petition drive and a town meeting against the spraying. Earlier that year, the State of New Hampshire had passed legislation placing approval of pesticide applications solely in the hands of the State's Division of Pesticide Control. The political voice of local people concerning use of environmental poisons in their communities had been eliminated. Stratford residents were some of the first victims of the new legislation. Despite strong local opposition, Boise went ahead with its plans to spray.

Boise Cascade and Champion International control hundreds of thousands of acres of forest land on both sides of the Connecticut River watershed. In 1995, Stratford residents learned that Boise Cascade was once again planning to spray herbicides in their area—this time in a wetlands area on the Vermont side of the river. Still angry over the events of 1993, communities on both sides of the river came together quickly, and this time were able to force Boise to cancel its plans to spray—albeit temporarily.

Champion International, which had also planned to spray in Vermont in 1996, recognized the strength of citizen opposition to spraying and has called a one-year moratorium—for Vermont only. However, Champion would not have canceled plans to spray in Vermont in 1996 if this concession had meant serious economic losses—so one can assume that the company could survive a moratorium in New Hampshire. We must make sure that public opposition to spraying in New Hampshire is loud enough to encourage Champion and Boise Cascade to do the same here.

Communities organizing against aerial application of herbicides in Vermont may have an easier time because Vermont has, as yet, no spray program as precedent. Although state boundaries are artificial divisions, with no relevance to undisturbed natural systems, they have significance in terms of industrial regulation. In New Hampshire we have to stop a destructive practice that is already ongoing. For the past decade, herbicide use has been wreaking havoc in thousands of acres of forest land in the Connecticut River headwaters area, an area already severely affected by continuous heavy logging. As community organizers, we have to turn this discouraging situation to our advantage.

The Herbicide Project plans to monitor areas that have been sprayed and document the effects of the spray program on the ability of the forest ecosystem to regenerate after extensive, destructive logging. In addition, we will be involved in community education about the effects of herbicides and alternatives to their use in forestry. Anyone interested in being involved in this effort is cordially invited to contact Daisy Goodman at (603) 922-5544, or through the ***Forum.***

Predictable Drift of Different Sized Droplets When Sprayed at 50 Feet

Diameter of Droplets	Cross Wind		
	1 mile/hour	5 miles/hour	10 miles/hour
microns			
10	1.5 miles	7.5 miles	14.5 miles
100	75 feet	375 feet	750 feet
300	8 ft. 4 in.	42 feet	83 feet
590	2 ft. 2 in.	10 ft. 8 in.	21 ft. 5 in.
800	1 ft. 3 in.	5 ft. 9 in.	12 feet

Source: H. Gratkowski. 1974. Herbicidal drift control; Aerial spray equipment, formulations, and supervision. USDA Forest Service General Technical Report PNW-14. Portland, OR: Pacific Northwest Forest and Range Experiment Station.

in runoff up to four months after application. Synergistic interactions of chemicals and bioaccumulation are two other areas of concern.

Leslie Hook also of Glover said he had come to "get some straight answers" about timber practices. "Clearcuts should never have got this far out of line," he said; "I am ashamed to be a Vermonter. [These] mistakes need challenging." "If you ever intend to spray, you'd better bring better movies and you'd better bring better speakers. Because I'm going to devote my life to teaching other people so it ain't going to happen."

Next Citizens' Roundtable Event

• As we head to press, a bill to place a moratorium on aerial spraying of herbicides has been introduced in the Vermont House (H.634). The bill would charge the Forest Resources Advisory Council with studying the public policy issues raised by aerial spraying, including the question of whether accelerated harvesting cycles are desirable and how the proposed spraying meshes with state policy of pesticide reduction. The bill also stipulates four public hearings on the issue; one to be held in Essex County, site of the anticipated spraying. The bill enjoys broad sponsorship; letters in support should be addressed to your House and Senate representatives (Statehouse, Montpelier, VT 05602).

• Anyone interested in being part of our citizens' effort to block spraying or having testimony to offer should get in touch with one of the Vermont Citizens' Forest Roundtable coordinators. Andrew Whittaker is at POB 72, E. St. Johnsbury, VT 05838 or contact Barbara Alexander at 802-586-2288.

• The next Vermont Citizens Forest Roundtable event will be on Wednesday March 13 at the Pavilion Auditorium, on State Street in Montpelier, starting at 9 AM with a presentation by Mitch Lansky on the Low Impact Forestry project in Maine. Starting at 1 PM, a panel of Vermont practitioners of low impact silviculture will address challenges to, and opportunities for, wider implementation of benign forest practices. The goal of the forum is to identify opportunities for public policy to foster a marriage of forest conservation and economics. A report will ensue; all are invited to attend; a donation at the door is requested; for further information contact one of the above Citizens' Roundtable coordinators.

LURC Revised Comprehensive Plan

Mountainous Challenge Faces Maine: Veneration or Neglect?

by Pamela Prodan

Two voices are there; one is of the sea,
One of the mountains; each a mighty voice:
In both from age to age thou didst rejoice,
They were thy chosen music, Liberty!
—Wordsworth

Mountains offer more than spectacular scenery. Their sheer massiveness and their ruggedness evoke feelings of heaviness and hardness, and of our own vulnerability in their hold. At the same time, mountains remind us of earthly love by their constant presence and physical substance. As Wordsworth understood, the sea also moves us, but for different reasons—the sea conjures up adventure and change, not the steadfastness of mountains. Maine is fortunate to have both mountains and sea.

Maine's mountains are also monuments to the North Woods' wild and undeveloped nature. While many of Maine's mountains are visible from a long distance, practically speaking, these are some of the most remote spots in the state. The difficulty of vehicular access makes most mountains inaccessible to all but hardy souls able and willing to climb steadily uphill for miles. Roads in mountain areas are few, and for good reason: the environment is harsh, making them difficult to build and maintain. The typical eastern mountain environment makes for ecosystems that are vulnerable to damage by man and slow to recover.

Erosion on higher slopes is essentially irreversible, the thin soils having taken thousands of years to develop. Even footpaths can sometimes suffer rapid erosion from light use. Where hikers have passed, lichens on high mountain ledges may disappear quickly and take hundreds of years to return.

Unless degraded, mountain soils provide abundant good quality surface water by filtering precipitation that eventually is added to stream flows, springs, and groundwater supplies in lowland areas.

Revised Comprehensive Plan

After years of studies and meetings, the Maine Land Use Regulation Commission (LURC) is poised to adopt a new Comprehensive Land Use Plan for the largest contiguous wildlands region left in the East. That Plan will guide the Commission, applicants, and other entities in making decisions about land and resource use in LURC jurisdiction.

While the existing Comprehensive Plan devotes an entire section to mountain resources, the proposed plan tucks mountain resources along with soils and minerals into a chapter called "Geologic and Mountain Resources."

The proposed Plan seems to continue to recognize that high mountain areas are uniquely valuable and delicate resources, yet it fails adequately to address the two most publicized and visible development threats to mountain areas today: wind power development and the proliferation of cellular communications towers. These striking weaknesses in the Plan portend that Maine's fragile mountain areas within the jurisdiction are seriously at risk. Without guidance, LURC will deal with these issues on an ad hoc basis each time they arise.

It is not particularly reassuring to read in the proposed Plan's discussion on rezoning for wind power projects the conclusion that, "high mountain areas are a limited resource in Maine, so it's not likely that all such areas will be considered suitable for rezoning and associated development by the Commission."

There is no basis for the Plan's statement that "Maine's wind resource is considerable and much of it occurs along high mountain tops and ridges within the jurisdiction." Since LURC has never conducted any studies to evaluate which areas of Maine are most suitable for wind power development, nor indicated it will require wind power developers to do so, one can infer that the unstated policy is "first-come, first-served." Presumably, the people of Maine will be left with whatever high mountains are not rezoned.

Mentioned only in passing in the new Comprehensive Plan, but also a growing threat to mountain areas, is the siting of utility facilities for cellular communications. The statement, "modular phone service is also now available to many locations within the jurisdiction" fails to comprehend the potential impact that the burgeoning cellular phone industry will have in the jurisdiction over the next decade. It is projected that the number of such towers ultimately constructed will be at least five times what exist now, making dozens of hills and mountains permanent beacons of technology's invasion into the wildlands.

These quotes leave one with the nagging feeling that LURC has no plans to deal with these issues, which will only be addressed once they reach crisis proportions. The Comprehensive Plan lacks any acknowledgment that it is impossible both to preserve and develop this limited resource. It ignores is obvious possibility that the best use of high mountain areas may be to leave them just the way they are today. Instead, amidst rising concern about insufficient protection of the North Woods generally, and at the same time as increasing pressure to "streamline" regulatory procedures and diminish standards of protection for natural resources, the new Plan comes close to ignoring high mountain areas, their values and limitations.

Basics of Mountain Ecosystems

A combination of factors, including low temperatures, short growing season, high precipitation, poor soils, and steep slopes, creates a fragile environment at higher elevations. A range of indicators is useful to identify these mountain areas, rather than the presence of a few visible features such as a rock-faced peak or alpine vegetation. Some typical characteristics of high mountain environments are as follows.

- Soils at upper elevations are shallow, highly acidic, and poor in nutrients.
- Slope characteristics change with elevation, with gradients at higher elevations usually over 30 degrees and often well over 50 degrees, making for rapid soil erosion once it starts.
- Rain and snowfall increase dramatically at the rate of more than six inches of water per 1,000 feet rise in altitude. At least five inches of water is added to upper elevations by fog precipitation.
- Summer rain events may be very intense with an inch of rain in ten minutes.
- Growing seasons are short because air and soil temperatures decrease with increasing elevation. There are 144 or more frost-free days below 2,400 feet, but only 94 or fewer above 3,000 feet.
- Among the soils in mountain areas are fragile soils called cryic soils. The average temperature at a depth of 20 inches does not exceed 42 degrees Fahrenheit in June, July and August. Since biologic zero is considered 41 degrees F, biologic activity, including growth of plant roots, only barely takes place.
- With the drop in temperature with elevation, there is a great buildup of organic matter in the soil, which cannot decay in the low temperatures. Such soils have a property called thixotropy, which means if compressed when moist, the soil will go from a solid to a liquid and turn to "mush," causing structural instability.
- It is often difficult to detect the presence of a water table on mountains, although groundwater is potentially close to the surface.
- Species diversity is low, a characteristic associated with ecological instability. At 1,800 feet elevation, there are 80 species of vascular plants, but only 52 at 2,600 feet and 17 at 3,200 feet.

The environmental break above which fragile ecosystems can be presumed to exist is thought to occur in Maine at lower elevations than in other northern New England states. Above this point the environment approaches subarctic conditions. Some evidence suggests that 2,200 to 2,300 feet or even lower may more accurately reflect the natural conditions that characterize high mountain areas than the 2,700 feet defined by LURC as a Mountain Area Protection (P-MA) subdistrict.

Rezoning a P-MA Subdistrict

Since the 1970s, LURC's regulations have zoned mountain areas above 2,700 feet as protected areas, with limitations on certain activities. According to LURC's regulations, the P-MA Protection Subdistrict was created to: *regulate certain land use activities in mountain areas in order to preserve the natural equilibrium of vegetation, geology, slope, soil and climate in order to reduce danger to public health and safety posed by unstable mountain areas, to protect water quality, and to preserve mountain areas for their scenic values and recreational opportunities.*

Timber harvesting is allowed in P-MA subdistricts. Between 1983 and 1992, the Commission issued about 16 Forestry Operations Permits for harvesting in P-MA zones, affecting approximately 6,500 acres of land. Other allowed uses mostly relate to timber harvesting or recreational activities. Only by special exception are permanent roads, certain utility facilities, mineral exploration and downhill ski-related facilities allowed. The applicant then must show that there is no suitable alternative site reasonably available and incompatible uses can be buffered from existing resources and uses.

LURC's statute and regulations provide that an area above 2,700 feet may be taken out of a P-MA zone if the change will satisfy a "demonstrated need in the community or area," and there will be "no undue adverse impact on existing uses or resources." The Commission also has to determine that another designation would not jeopardize significant recreational or historic resources and would be consistent with its laws and Comprehensive Plan. Conversely, regulations allow areas below 2,700 feet to be incorporated into a P-MA zone "when vegetative cover, geology, degree of slope, soil type, and climatic conditions indicate the need to protect such areas."

In determining whether areas above 2,700 feet in elevation should be taken out of a P-MA Mountain Area Protection Subdistrict, regulations require very specific evidence that shows, among other things, that the area meets the definition of the Subdistrict in which it is proposed to be placed and that there are no areas of scenic value or recreational opportunity which will be unreasonably impaired by the exclusion.

Maine Windpower Plan Stalls; Legal Challenge Continues

by Pamela Prodan

Amidst widespread reports in the media of the company's technical and financial problems (**Wall Street Journal** 12/13/95; **New York Times** 12/27/95), Kenetech Windpower, Inc., reduced its presence in Maine with the layoff of the director of its Maine project, Christian Herter, III. Opponents of the Boundary Mountains project are proceeding with appeals of two separate permits issued by the Maine Land Use Regulation Commission. Both appeals present significant hurdles to the project.

Financial Problems

At the beginning of December, 1995, Moody's Investors Service and Standard and Poor's lowered the security ratings of the Kenetech Corporation, reflecting the investment world's expectation of further deterioration in the company's cash flow, liquidity and competitive position. The downgrade followed the company's disclosure of problems with some of its 33M-VS wind turbines at its new wind farms in Texas and Spain. Problems include thrown blades at two of its turbines in Spain. The 33M-VS, which has a blade sweep of 33 meters, is the one proposed to be used in Maine.

On September 28, 1995, shareholders filed a class action lawsuit against Kenetech in San Francisco, alleging that Kenetech officials had given analysts misleading information. The suit alleges that top executives and directors falsely claimed Kenetech turbines could compete with coal by producing electricity at five cents per kilowatt hour. It is further alleged that company officials continued to make such claims even in the face of facts to the contrary.

In June, 1995, Kenetech had failed to comply with an interest coverage covenant under its bank working capital line, resulting in a forbearance agreement under which Kenetech is now operating through February 1996. This means that Kenetech has no availability remaining under this working capital line.

Two top managers hired in the last year to try to turn the company around have left. A spokesperson for Kenetech is reported to have told the **Maine Sunday Telegram** that the corporation is "teetering on the brink of bankruptcy," and the company is "taking another look at the $200 million complex" in the Boundary Mountains.

Superior Court Appeal

Meanwhile, the Western Maine chapter of the National Audubon Society and other environmental groups and individuals are proceeding with their Superior Court appeal to overturn the August, 1995, decision by the Maine Land Use Regulation Commission (LURC) to approve the rezoning of the Boundary Mountains and Kenetech's preliminary development plan.

Since the Court appeal against the state agency asks that the mountains be zoned back to protection area subdistricts, it is likely to continue even if Kenetech decides to drop the project at this time. Only if LURC were to take back the approvals it issued in August would the appeal be moot.

At this juncture, LURC has filed the administrative record with the Court, and the appealing parties have filed a motion asking the Court to take additional evidence on the issues of unlawful procedure and bias.

The environmental groups make specific allegations of violations of agency procedures in their complaint, and in order to prove those allegations, the parties will need to have the Court look at evidence that is not in the official administrative record. For example, the appealing parties obtained important information, none of which is in the record, on December 6, 1995, through a Freedom of Access (FOA) request made on LURC. Documents obtained describe discussions that took place between Kenetech and the Staff at more than one meeting in violation of LURC rules.

In addition, detailed information concerning the process leading to LURC's final approval also surfaced though the FOA request. The information indicates that by the fall of 1994, LURC Staff had prepared a recommendation to deny the permit, but the recommendation was suppressed after Kenetech representatives discovered that the proposed recommendation was not favorable. Eventually, the head of the Maine Department of Conservation took the original Staff members off the project and assigned preparation of a favorable document to other LURC Staff.

The primary allegation of the opponents remains that Kenetech did not prove that its proposed project met the criteria set out in LURC statutes and regulations for development in a protected mountain area. However, the appealing parties' motion to take additional evidence was timed in order to preserve for appeal the issues of unlawful procedure and bias. If the Court grants the motion to take additional evidence, by discovery methods used in other types of civil cases, the appealing parties intend to prove to the Court that there were violations of LURC's procedural rules. Such violations in and of

Continued on page 31

Also required are a soils map showing soil type or soil group names, and a description of their characteristics, demonstrating that the area possesses depth to bedrock of 20 inches or more, well or moderately well drained soil, slope of less than 25%, a mature soil profile, and nutrient content and pH status proper to encourage the establishment of vegetation.

These regulations demonstrate the drafters' intent to take great care when making a decision to take an area out of a mountain protection zone. The regulations, as they are written, appear to offer adequate protection, but it's unclear whether the Commissioners have actually read them.

Even before Kenetech Windpower, Inc., first proposed building 40 miles of new roads on top of high mountains to accompany its wind turbines and power collection lines, questions had been raised about the ability of mountain areas to withstand intense development. However, LURC did give preliminary approval in 1995 to the Kenetech project, changing approximately 20 western high mountain peaks and their associated ridgelines near the Quebec border from protection to development zones. That decision is under appeal. *(See story on this page)*

Conclusion

Mountains have always provided a powerful mystique for those who encounter them. The official, but not well known, name of the principal ridge of the Appalachian Mountains in Maine is "Longfellow Mountains." Is it too much to ask that we make a special effort to protect such monuments of nature, if not for their own sake, then for the poet within us? Or will our mountains suffer the same fate as most of our rivers, shorelines, wetlands and forests: utilized and converted for the most part, with only a few gems saved as museum pieces to remind us of what once was, but is no more?

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A Hike Through an Ancient Forest in the Upper Buffalo Wilderness

Editor's Note: Last October I had the pleasure of attending the Third Eastern Old Growth Conference, held in conjunction with the annual conference of the Natural Areas Association. Following the conference, David Stahle of the Tree Ring Lab at the University of Arkansas invited several of the participants to the Upper Buffalo River Wilderness in the Ozarks for a memorable hike through some extraordinary old growth forests. Rob Messick, one of the most dedicated and knowledgeable eastern old growth sleuths offers this account of that glorious day.

text & illustrations by Rob Messick

Every time I attend one of the annual eastern old growth conferences my eyes are opened again to the wondrous ancient forests that remain here in the east. We still have patches of forest that are windows into evolutionary history, yet they are too often steeped in mythology and threatened with extinction from unscrupulous timber interests. My focus over the last year has been on identifying and verifying old growth forests in the Grandfather District of Pisgah National Forest in western North Carolina. I have learned much from old growth field workers who preceded me especially from Will Blozan who works with the Great Smoky Mountains National Park.

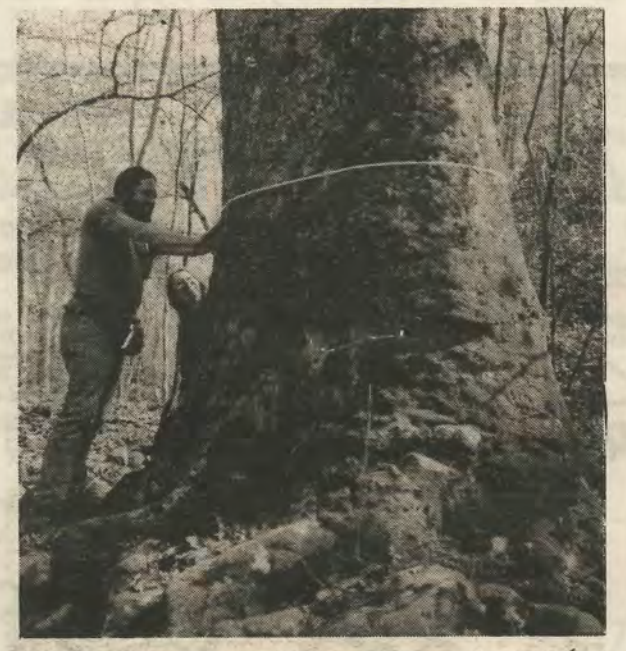
The third eastern old growth conference in Fayetteville Arkansas, in October 1995, held in conjunction with the annual Natural Areas Association Conference, brought attention to the Ozarks and other forest ecosystems of the coastal plain. I had never been to the Ozark Mountains, home of the famous Tree Ring Lab at the University of Arkansas headed by David Stahle. A big treat for us during the congress was visiting the Tree Ring Lab and ogling over the core samples and equipment!

After days of propping ourselves up to keep from lilting in the warm and stuffy indoor atmosphere of the conference, we were invited out to David's Cabin near

the Upper Buffalo River Wilderness to explore Ozark Old Growth. It was great to get away from all the facts and figures and experience what we had actually come together for.

The sandstone bluffs of Arkansas were new to me. We needed a rope to get over the lip of the bluff and then edged along the cliffs toward the branch of the Buffalo. The terrain was far too steep for logging at this point, and a large shagbark hickory caught my eye. I went down to measure it and it was an impressive 26.7 inches dbh (diameter at breast height). The forest here at the base of the nearly vertical sandstone cliffs was dominated by American beech, sugar maple and hickories with associated umbrella magnolia and some northern red oak. Moss, ferns and a few varieties of lichen were also present.

Moving on down this tributary of the Buffalo River we encountered some slippery shale near a small waterfall. We got to a large tree that everyone was looking at and trying to identify. I scrambled up to it thinking it was possibly a butternut tree (a.k.a. white walnut). On closer inspection with binoculars I could see the end of the compound cluster of leaves had one



Rob Messick measures the circumference of a 48.9 inch DBH (diameter at breast height) American sycamore on the banks of a tributary to the Buffalo River. Norma Ivey who coordinated the Seeking Older Forests Campaign in western North Carolina in 1994-1995 peeks around the sycamore. Note the moss-covered bark. Photograph by David Stahle

smaller leaf—that means it's black walnut. Inspection of the forest floor yielded black walnuts as well. This tree was 26.8" dbh, and everybody sighed at its stature. The presence of black walnut shows that there are rich soil conditions in this riparian area. Nearby there was a sweet gum tree in the stream amid much down wood that measured 38.2" dbh.

Further downstream I noticed that American beech trees here don't have beech blight (we have it in the Southern Appalachians at higher elevations). *[Ed. note: It's a serious problem in the Northern Appalachians.]* We discovered some beech trees over two feet in diameter at an old roadbed. Up to this point there had been no trails, roadbeds, or cut stumps. Reading light-to-heavy signs of past human disturbance is essential in old growth work. In this case loggers had made it down to this feeder stream but were prevented from continuing much further downstream due to rough, rocky terrain. One of the remnant beech trees here had the date "February 28, 1938" carved on it, which could be useful in dating past human disturbances.

As we moved down the rocky streamway looking up at old forests and staring down into emerald colored water (caused by minerals in the water) I was drawn to the beauty of the place. "What a gift it is to experience the heart of the Ozark Mountains" I thought.

Dendrochronologists will tell you, a good way to get an idea of a forest's history is to do some plots and take some core samples. The life rings of trees can tell unexpected stories. Just below a natural bench near the stream most of the party had stopped to try to identify a particular tree. Ed said it was likely not ash because there were no opposing twigs on the end limbs. I though it was ash because it was near the stream and the bark patterns resembled old ash. David Stahle thought it was a hickory tree because it did not resemble nearby ashes we could see across the stream. Tree identification in hardwood forests can be very difficult in winter and in the late fall because there are often few leaves left on the limbs, and when trees get larger in diameter the bark patterns can go through remarkable transformations (often much different from mid-size or younger trees of the same species).

David pulled out his coring device and took a small sample. The smell and ring structure told the story—it **was** hickory. On the bench above us there were two large hollow black gum trees—the largest measuring 36.7" dbh. Black gum is a species that Will Blozan has found to be generally slow growing, and potentially hundreds of years old at this size.

As we made our way down to the Buffalo River we scrambled through caves of broken rock in the streambed, and encountered a sassafras tree near a vertical cliff that was 40.6" dbh. We were moving back in time as well—from two to three million year old ocean-lain sandstone to older limestone with small fossils (amid darker slabs of shale).

Sycamore trees became very common at this lower elevation. They started at 35" dbh and I measured progressively larger ones as we made our way downstream until we got to *the* sycamore tree. It towered over us as we stood on those aged rocks, among swirling waters, with expressions of awe and exasperation coming from our lips. "I have never seen a sycamore that big" I proclaimed after winding up the measuring tape. This tree was 48.9" dbh!

When we hit the Buffalo River we worked our way upstream. The view of mountains from the river bed gave the sense of being deep inside something, something that was alive and throbbing, something that contained a link with this continent that is beyond description. Beaver sign was found repeatedly along the river, as were fish that migrate much of the length of the Buffalo.

We came upon a cathedral forest grove by the river that made my jaw drop. The stand was dominated by American beech and sweet gum with associated butternut hickory and a few white oak. The soil was sandy, deposited from many previous river floods. I measured an exceptionally straight and mossy American beech at 43" dbh. A nearby sweet gum (which had bark that looked deceptively like white oak) was 34" dbh.

On the way up the ridge a few of us stopped to take a basal area measurement in forest that was away from the riparian area but still dominated by beech and sweet gum and a few oaks. It measured a moderate 120 square feet for both this stand and a drier oak-dominated stand further up on steeper slopes. When we got to an overlook David Stahle pointed out where the boundary of the wilderness was as he munched on highbush blueberries. This eagle's view of the river valley in autumn reminded me of my home in the Southern Appalachians, though the geology and the climate are much different.

We built a whole civilization out of the guts of trees. For thousands of years before our intrusions trees stood and fell as sentinels of life-giving soil, air and water. They stood as the genetic integrity of their species, providing habitat for countless organisms. These very trees can tell us much about the climate and natural history of the various regions of the eastern United States. We would do well to pay homage to them, and prevent any further damage of the few remaining patches of old growth forest we have left.

Rob Messick has lived in the Globe Valley of western North Carolina for eight years. He knows the history and terrain of the Grandfather District of Pisgah National Forest well. He spent seven years as co-editor and graphic artist with ***Katuah Journal****, a publication that came to be known nationally among readers of the alternative press. He has also served on the board of the Western North Carolina Alliance, and participated in the Seeking Older Forests Campaign (which was successfully completed this year). He has also worked with the Great Smoky Mountains National Park Old Growth Team.*

Biological Integrity ~ A Quantifiable Measure of Ecological Health

An Interview with Professor Stephen Trombulak

Jamie Sayen (JS): At the Northeastern Forest Congress in Durham, NH, Chuck Gadzik, director of the Maine Forest Service, reported that, according to the Maine Biodiversity Project, "There is no biological crisis in the Maine Woods." Your article, "Ecological Health and the Northern Forest" (**Vermont Law Review**, Spring 1995)[1] suggests otherwise. Would you comment on Mr. Gadzik's assertion?

Stephen Trombulak (ST): Well, the main thought that went through my mind while listening to Chuck's talk was: How would you define crisis? If we want to apply numbers to this, the assessment that I did for the Vermont Law Review Conference in the fall of 1994 found that in the Northern Forest states of Maine, New Hampshire, and Vermont, for every well-inventoried taxa—the plants, the birds, the mammals, reptiles and amphibians—the percentage of species that are listed as of some conservation concern—rare, threatened, or endangered—by the states themselves, are almost all in the double-digits. They range between 6% for conifers in Maine to 46% for reptiles and amphibians in Vermont.

Maybe you consider that having 25-30% of your vascular plants listed as some kind of conservation concern—rare, threatened, or endangered—is not a crisis, but you owe it to the public to give your definition of what would constitute a crisis. Actually, the word "crisis", to me, immediately raises all sorts of problems. How bad do things have to be before you actually say that there's a crisis? And given whatever your working definition is, do you withhold acting on anything until it is a crisis?

My mind just doesn't work that way. The numbers I was able to get from the state governments when I did this assessment for the **Vermont Law Review** indicate to me that there are large enough percentages of species that are of some concern; there is a small enough percentage of old growth forest; there is a large enough percentage of the flora that is exotic; there is high enough percentage of our waters that are not fully supporting of their uses, that we really ought to take some action. Whether you call it a crisis, a problem, or an issue is irrelevant.

JS: What actions should we take, and what would be the goals of those actions?

ST: Let me answer the second question first. The goal of any conservation strategy, which is a collection of actions, ought to be to protect and restore biological integrity in a region.

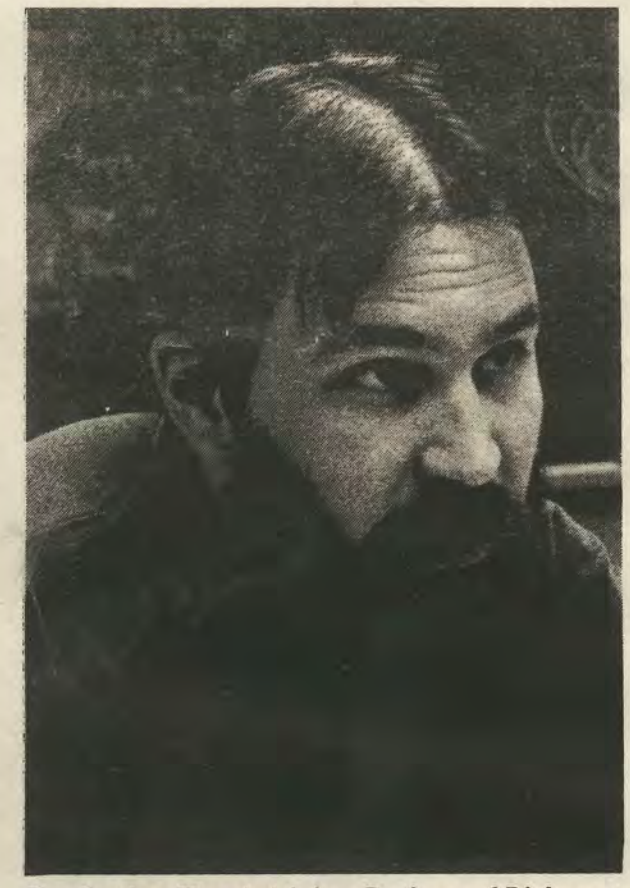
The concept of biological integrity is not new. It's built into the Water Pollution Control Act Amendments of 1972. The idea is that we should take a look at the full sweep of biological diversity that exists within an area at all levels of organization. We should preferentially target the health of native species as opposed to exotic ones. We should want these species to live at population sizes that allowed them to be viable over the long-term without constant effort on the part of humans. We want full representation of ecosystems. We want normal ecological and evolutionary processes to occur. And, the idea that we would be looking at ecological systems from the perspective of their integrity, as opposed to just what the components are, what people classically think of as biological diversity, is really the long-term goal that we ought to be aiming for.

We can maintain biological diversity in terms of species numbers if that were our goal, by importing all sorts of exotics. For every native species that disappears we'd import yet another exotic to take its place. But I think in the long-term that's not really the goal. What we'd like to have is to have nature operate in its own way, in its own time, with as little effort on our part. So what we should work toward is a conservation strategy in which biological integrity is maintained or improved as much as possible with as little constant infusion of money and effort as possible. One lesson that I've learned in studying nature as an ecologist, is that nature has done pretty well for itself over three and a half billion years of the existence of life on earth because it operates on very large scales.

So, I think one important element of a conservation strategy would be the development of a system of ecological reserves that allows for large-scale ecological processes to occur and allows for viable populations of large-ranging species to exist. This isn't to say that a system of large-scale ecological reserves would, by itself, be the only thing that we need. It isn't to say that every species or every ecosystem requires it in order to be maintained. The point is that without it, you lose those species, ecosystems, and processes that require large areas, and as a result you have reduced biological diversity. So, you would think of a system of ecological reserves as a necessary component to the overall conservation strategy that society ought to think about implementing.

Another important aspect to realize about ecological reserves is that they are part of a larger pattern of land use in a region. Where we don't have ecological reserves we do have areas where high-impact human occupancy and extraction of resources are going on.

If you want ecosystem management, you're going to have to have ecological reserves as part of that mix that can allow biological integrity to be maintained and still allow extraction to occur on other parts of the landscape.



Dr. Stephen Trombulak is a Professor of Biology at Middlebury College. He has also served as Director of the Environmental Studies Program at Middlebury. He is co-editor (with Christopher McGrory Klyza) of ***The Future of the Northern Forest*** *(University of New England Press, 1994). In addition to his many scholarly publications, he is a regular contributor to* ***The Northern Forest Forum****. In December 1995 Dr. Trombulak delivered a talk about the ecological health of the Northern Forest region in which he developed the concept of measuring the biological integrity of forest ecosystems by utilizing an "index of biological integrity". His talk was the most important, and well-received, presentation at an otherwise very disappointing "Northeastern Forest Congress." He generously agreed to permit the* ***Forum*** *to print a draft version of his work-in-progress on the index of biological integrity printed on pages 22-23. The following interview, conducted in mid-January, 1996, provides some background material for his article.*
—Jamie Sayen

JS: Is ecosystem management a legitimate substitute for reserves?

ST: No. Ecosystem management is not a substitute for reserves. Reserves are a necessary component of large-scale system of ecosystem management. In my opinion, for ecosystem management to work, in order to achieve its goals, there has exist a system of ecological reserves because we know that there are some aspects of nature that require unmodified, undisturbed land and water to exist. So, if you want to achieve all these multiple goals of ecosystem management, you're going to have to think about not applying the same low level of extraction to every acre. You're going to have some areas—hopefully some rather large, continuous chunks of land and water—that are not subject to extraction of any type.

JS: Can a natural community be healthy if so many species are at risk?

ST: I don't think so. Ecological health is a concept that many ecologists feel uncomfortable with. I wrestle with it myself, but I always end up putting it into perspective by comparing it to the health of a human being. What does it mean for me to be healthy? Am I more healthy when I have a broken leg but no pneumonia, or when I have pneumonia but no broken bones?

Health of a human being or of an ecosystem is a composite measure of lots of different characteristics. If you have a lot of species that are of some conservation concern, the ecosystem is less healthy than it would be if those species weren't of concern. Health, then is not just one set point—you're either healthy or you're not. It exists as a spectrum. None of us is perfectly healthy. We still strive to be as healthy as we can. We work toward greater health.

If our goal is ecological health, one of the things we have to pay attention to is the very high percentage of species that are rare, threatened, or endangered. Another thing we need to pay attention to is the age structure of, say, for example, trees within forests, as well as patterns of disturbance, gene flow, and trophic structure, plus many other things.

All of them are considered in looking at a piece of land and saying how healthy it is.

JS: If I want to measure the health of a forest ecosystem in the Northern Forest region, what's my benchmark? What am I measuring it against?

ST: If you're interested in biological integrity, you really have only two choices. One is to find parcels of land that more closely resemble what would exist there in the absence of large-scale human modification than other parcels of land.

JS: Examples?

ST: Well, examples would be things like existing tracts of old growth forest. Let me preface all this by saying there is no pristine land on the face of the earth anymore. There's no pristine water anymore. The widespread occurrence of air pollution and water pollution have foreclosed that for us for millennia. So we really shouldn't say we're going to look for the absolutely pristine piece of land, and if we can't find it, we're going to give up. That's pointless.

What we have to do is say, "Let's find the land that is modified the least. Let's find the land that is as close to conditions as would occur in the absence of large-scale human modification as possible, knowing that the perfect plot of land won't exist. So that's one of the benchmarks we can use.

For example, existing tracts of old growth. Most of these are pretty small. But, in the Adirondacks, large parcels of old growth forests for that particular ecosystem type are pretty good benchmarks for what you would expect nature to look like and how nature can operate in an ecologically sustainable way.

The other benchmark we have is the fossil record. We have reasonably good evidence from the pollen record and other plant fossils spread over a very wide area of what the frequency of disturbance was in pre-

[1] A shorter version of this article was published in the **Forum**, Mid Winter 1995 (volume 3 #3) under the title "Ecological Health of the Northern Forest, pages 8-12.

human colonization times.

People quite rightly raise the issue that Native Americans were present in North America too, and they modified the landscape. But, in fact, the Native Americans didn't modify northern New England all that much. Southern New England, yes, but if you read Bill Cronon's really quite fantastic work **Changes in the Land**, northern New England under native occupancy was relatively little modified. The conditions prior to European colonization are a pretty good indication of what the forest would look like if we weren't exerting a lot of influences on it.

Pollen and other fossil remains will tell us about the distribution of forest types, about the frequency of fires; they'll tell us about what species were present; they'll tell us about patterns of change in species distribution, in other words, we can learn a lot from the fossil record about what would happen before we got here.

You have to remember that change is natural, and the further back you go in the fossil record, the more you're going back to a time where conditions may be quite different than today. Go back 15,000 years and what you'll find in northern New England is a block of ice about a mile thick. So you have to use the fossil record wisely to interpret what it is that we'd like to have today, but you can use it nonetheless. So those are the two benchmarks that I would look at.

JS: You're saying that the fossil record is a way we can measure this relative health issue even in areas that have been heavily disturbed and where very little even quasi-mature forest survives? The industrial forests of Maine are an example—several millions of acres that have been clearcut or heavily cut repeatedly for 150 years.

ST: I would hate to use the fossil record alone. I think if you're dealing with a situation like Maine, you have to recognize that Maine is not an island apart, ecologically-speaking. There are spruce-fir forests found in other places within this band that Robert Bailey, a geographer with the U.S. Forest Service, refers to as the Laurentian Mixed Forest Province. We can draw some inferences about what the benchmark parcels of land would look like in Maine, had they not been cut, by looking at other regions.

So the state of Maine has more than the fossil record to draw on. It does have some small parcels of old growth that it ought to look at. It ought to look at larger parcels of old growth in the same ecoregion that spreads all the way out to Minnesota as well as the fossil record to try to paint a picture of what an undisturbed, unmodified landscape would look like—an integral landscape, one with a high degree of integrity.

JS: Some efforts to protect biological diversity have adopted a goal of achieving protection for representative communities, as opposed to what I think you're talking about, which is a more encompassing goal of biological integrity. Could you address what the difference is and why you prefer to focus on biological integrity rather than only on representativeness?

ST: Representativeness of ecosystems is a component of biological integrity. You can't have a high degree of biological integrity unless you've protected all ecosystem types. But, there's a whole lot more to it than that. You could protect representative ecosystems, but do it in such a way—say for example, have them all represented in tiny little two hectare reserves—that you wouldn't be able to maintain viable populations of the native species that live in those ecosystems. So representativeness alone doesn't guarantee that you'll have biological integrity.

JS: In a system that is designed to protect representativeness, what's the role of disturbance and of ecosystem processes, particularly if you've got relatively small examples rather than relatively large examples?

ST: If you're designing your reserve system solely to achieve representativeness at the present moment, you don't have to think about disturbance. You don't have to think about ecological processes. You're only asking yourself: Is this particular ecosystem-type represented in some management category that you think makes it protected. You don't have to worry about those other messy things.

JS: But what happens when a small tract such as the Cathedral Pines in northwestern Connecticut gets blown down, as happened in 1989? In other words, when you get a big windstorm, a big fire, or a big pest outbreak that essentially eliminates a natural community from your representative system?

ST: That's why I think a representative system that is not designed with the overall goal of integrity is not likely to succeed over the long-term. If the only thing you're doing is saying: "Oh, look, it's here, ecosystem type X is present, we don't have to worry about doing anything more from a conservation perspective," you run the risk of having a Cathedral Pines incident. And then it's gone.

If, instead, you say, "We want representativeness, but we want to make sure that it can be maintained over the long-term," you've immediately kicked your design goals up to the level of integrity. You want to start talking about ecological processes. You want to start asking, "What does it take to make sure that these ecosystems are not merely represented now, but they themselves, and the species that live there, are viable over the long-term."

As soon as you start talking about those kinds of things with respect to designing an ecological reserve system, you've immediately expanded your sphere beyond mere representation to maintenance of integrity,.

JS: For the greater Northern Forest region, what is it going to take to design a system of reserves that will protect the biological integrity of the entire system—all the different communities that are native to it, the various changes we can expect and that we can anticipate without being able to predict?

ST: What's it going to take to design it? Speaking as a scientist, you really need the information—the data. If your goal is to have all ecosystems, you need to know what the distribution of ecosystems is across the land. This is a problem that can be addressed, by and large, with tools like aerial photography and satellite imagery. Our ability to discriminate between old growth forest and younger forest of a particular community is limited at this point. However, over broad community types, the current state of the art is reasonably good.

You'd also want to have data on things like the distribution of species, and not just the warm, cuddly ones, or the attractive ones like butterflies. Nature does not really respond to or care all that much about beauty and attraction. All organisms play some role in an ecosystem. We need to be thinking more broadly about those taxa that we're interested in—bacteria, fungi, terrestrial organisms, aquatic organisms, vertebrates, invertebrates, canopy-dwellers, underground animals, day-active animals, night-active animals. In other words, the whole web of life. And we need the data on their distribution. Because if you're interested in integrity, you have to have as a goal viable populations of all native species. You need to know what species you're talking about, and you need to know where they are.

You also need to know about the ecological and evolutionary processes—processes like predation and the movements of predators, nutrient cycling, carbon flux, the rate of replenishment of soils, the frequency and intensity of disturbance such as fire and wind damage.

There was a very large storm blowdown in the Adirondacks this past summer. As far as I've been told, it represents a natural process. Large tracts of forest do get blown down, and new forests regenerate on site. We need to have more information about what kinds of scales those kinds of disturbances operate on so we can design reserve systems that allow for that without having another Cathedral Pines incident.

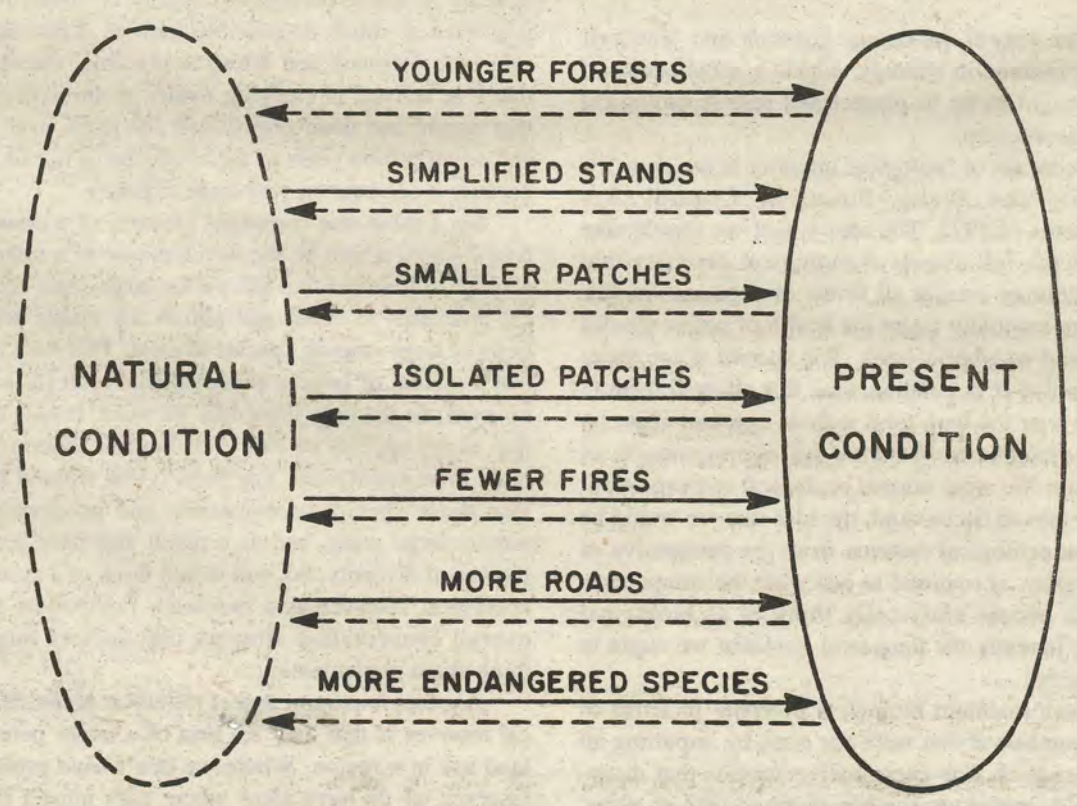
We also need to know more information about how change occurs. We know, as I said earlier, 15,000 years ago it was a block of ice here, and the block of ice melted, and we now have the forests that we see today. And that involved a very complex mix of plant species migration from the south, from the west, and from the east. How did different species migrate? What were the requirements that allowed them to change their distribution in response to changing climate? How did the animals move into the area?

So we need more information on natural patterns of movement—the short-term by animals, and the long-term by plants. That's where I'd start. I'd like to know about where things are and how they got there.

JS: Let's assume now that you have that information, or enough of it so that you can go to the next step. What are you going to do when you have that information?

ST: Are you talking about designing or implementing?

JS: I think you have to design before you can implement.



This chart, designed by Reed Noss, illustrates the relative direction an ecosystem must move in order to restore Biological Integrity. The "natural condition" is characterized by older forests, more complex stands, larger, more connected patches, no roads, fewer endangered species, and natural disturbance regimes. The closer the "present condition" is to the "natural condition", the higher its relative Index of Biological Integrity will be. Policies and ecosystem management proposals must be judged by what direction (toward or away from a more natural condition) they move an ecosystem.

ST: In order to achieve implementation, you really have to include the public in the design phase, and that can best be done if the public has access to data.

When I have done this kind of thing with students at Middlebury College, where I teach, I do not tell them what I think they ought to design, I simply give them data and say, "OK, we've talked about achieving particular goals—the goals of biological integrity—and here's the best available data. What would you do in order to achieve this goal? How would you go about developing a reserve system, or any kind of system of land use practice that would result in the achievement of this conservation goal?"

They inevitably come up with some sort of system of ecological reserves that highlights protection of all ecosystem types, but especially those that are already rare; areas that provide habitat for species of conservation concern; large blocks of land for species that need it; and natural movement corridors.

So, I see the development of a large-scale ecological reserve system, which, by definition, is taking place throughout a very large area, not only requiring, but being facilitated by involvement of the public who have access to the data.

My profession needs to do a better job to educate people about the importance of biological integrity. I think conservation biologists in general have been talking about biological diversity for a long time, and among ourselves, I think we pretty much knew implicitly that we were talking about native species and aspects of diversity other than just the species themselves.

But, those "subtle nuances" were lost on the public, and now we've had many people who pretend to represent ecological interests and pretend to represent academic ecologists, but very seriously misrepresent the science by indicating that exotic species aren't a problem and species richness—just the raw number of species out there—is somehow the goal. They suggest that if we go in and modify the landscape so we increase the total number of species—that we have somehow achieved our goal. But that's silly. Adding cockroaches and rats increases biodiversity *per se*, but would be foolish to promote. The public gets understandably confused by the misrepresentation.

As the first step in developing a strategy that will achieve biological integrity, I think the academic ecological and conservation community needs to do a much better job in communicating what's at stake, what the real goals are, so that it's not as easy to pass off an increase in exotic species or weed species as somehow achieving a conservation goal simply because it increases "biodiversity".

JS: We've been talking quite a lot about biological integrity, and one of the problems we often have is that we are talking about a qualitative concept, and yet, in society, there is a need to quantify it, to measure it. In the accompanying article we are running by you ("Biological Integrity as a Management Goal in Forested Ecosystems"), you describe an index of biological integrity. Could you explain how this approach gets at measuring biological integrity.

ST: I just want to emphasize what you said in that question: a need to quantify things. In the article, I think folks will realize I'm not talking about an absolute measure such as: "The biological integrity of this region is four." Nothing like that exists. It doesn't exist that way for democracy; it doesn't exist that way for national security, or economic health, or human health. Absolute measures just simply don't exist for a lot of value-based decisions.

But we do have a crying need for a relative measure of ecological health, because a lot of what we're talking about at the local level, at the state level, at the national level, are conservation policies where we hope that they are going to do a better job of achieving our goals.

How will we know? How can we assess whether or not NEPA (National Environmental Policy Act) or banning all chlorine products is going to better achieve a particular goal? We very very badly need some sort of relative measure of biological integrity so we can assess, either before the fact or after the fact, the consequences of that policy.

Well, fortunately for us here in the Northeast, such a measure already exists. In 1972 the Water Pollution Control Act introduced into the US Code the importance of biological integrity, which immediately set up the requirement that the biological integrity of America's waters be able to be assessed.

Jim Karr, who is now at the University of Washington, really was at the forefront of developing an index of biological integrity that could be used in aquatic systems. There were some limitations to the index that he created for these aquatic systems. I think they were heavily oriented toward fish and the species level of biological organization. But it was reasonably good at achieving the particular goal of the EPA, which was whether particular water standards and regulations were improving the biological integrity of our aquatic environment.

I have thought for quite some time that it would be useful to have something similar, but more expansive, to assess the biological integrity of terrestrial systems. Because I live here in the Northeast and have been interested in regional forest policy for a number of years, my mind immediately turned toward an index of biological diversity for forest ecosystems. Can we think expansively about being able to assign a relative ranking of integrity to a particular parcel of land and to use that same ranking system to assess whether or not a particular policy recommendation is going to improve biological integrity or make it worse.

It highlights an extremely important point that everyone seems to lose sight of at one time or another: *there are no absolutes.* Natural, wild, healthy, integrity—none of these things exist in only two conditions—yes or no. You are natural, or you are not natural; you are wild, or you are not wild; you are economically healthy, or you are not economically healthy. These are simply not useful ways of looking at the world.

Life exists on a spectrum, and our goal is not necessarily to get to the endpoint, but to be moving in the right direction. As a scientist, I think of vectors—the direction that you are moving and how fast you are moving that way. We need to have a way to assess the vectors of our policies, of what our businesses are doing, of what our conservation organizations are proposing. And an index of biological integrity is a relatively unambiguous way to deal with that.

JS: Is this something you need a Ph.D. to implement, or could a citizens' watershed council apply this?

ST: If my work is ultimately successful, a citizens' watershed council should be able to apply it. As you can see in the article, my goal is to literally be able to develop a comprehensive list of variables that could be looked at to assess the ecological health of a region.

Like human health—what are all the things you think about when you think about your health? You ask yourself whether you have any diseases, whether you've got broken bones, whether your organs work, or you're missing a body part. There are all these different things that are associated with our health.

Well, there are all these different things that are associated with the ecological health of a region. So, if a watershed council's goal was to assess the ecological health of an area, they would have to be measuring several different things. Some variables take a lot of time and money to measure, and perhaps a citizens' watershed council doesn't have the resources to do it, but there are other things that they can measure. The strength of their index will be a function of how many different variables they were able to look at.

Let me put it again in the context of human health. If you went to doctor number one and asked him, "how healthy am I?" and that doctor said, "Say aaah," and he looked down your throat and said, "You're healthy," and then you went to doctor number two, and she did a complete work-up—blood tests, x-rays, tested your reflexes, looked in every orifice, and then said, "You're healthy," which assessment would you have more confidence in? You'd be crazy if you didn't have more confidence in doctor number two's assessment.

In other words, your confidence in the assessment on whether or not there's a crisis, how healthy the ecosystem is, or that there's no problem posed by a particular land use practice is going to be based on how many diverse things were used in developing that statement. So, the strength of your index of biotic integrity is going to be a function of the different variables you use to assess the ecological health of an area. I think it's possible to do a reasonably good analysis with a relatively small subset of those variables I list..

And my goal is for a watershed council to be able to do it.

JS: In the northern New England states we've got several initiatives assessing the sustainability of forest practices right now. You're suggesting the index of biological integrity could be a tool for a landowner in assessing proposed management practices on their land?

ST: Yes, but not necessarily for sustainability. The IBI is not designed to give you any index of whether or not your land use practices are sustainable. They're designed to tell you whether or not a particular land use practice is going to improve or degrade the biological integrity of an area.

I think biological integrity is incredibly important, and over a long period of time, if you don't have biological integrity, you don't have sustainability.

JS: The article we are running is a relatively early draft of something that you and others will be working to develop and refine. This is a work in progress, correct?

ST: Oh, sure. The exact history of this is that this represents some thoughts that I put together for the Northeast Forest Congress meeting held in Durham, NH in mid-December. It was not intended at that time to be a published document. It was a set of ideas that I wanted to put out for consideration by the people who are going to represent our region at the Seventh Forest Congress in Washington, DC in February. The interest among many different parties in the potential power that such an index could offer them in their work, as a result of my talk, was so strong that I then wrote the

Continued on next page

Biological Integrity as a Management Goal in Forested Ecosystems

by Stephen C. Trombulak
Professor of Biology & Environmental Studies
Middlebury College

Conservation interests want ecological health to be taken seriously. Economic interests are reluctant to embrace management goals that cannot be defined or measured. The concept of biological integrity, especially the use of an Index of Biological Integrity, potentially satisfies both concerns.

The development of all management plans is fundamentally a two-step process: (a) identify a goal, and (b) identify actions that best achieve the chosen goal. These are sequential decisions. Management actions can be perfectly designed and executed yet result in no net conservation gain if the chosen goal is inappropriate. Selection of the most appropriate goal is essential if time and money are not to be wasted, opportunities not to be lost, and conservation problems not to be inadvertently made worse. Within the conservation community, several goals have been proposed, including management for single, high-profile species (e.g., Northern Spotted Owl in the Pacific Northwest), protection of biological diversity, representation of all ecosystem types, sustainability, and protection and maintenance of biotic integrity.

As I and others have argued elsewhere (Karr 1990, Hughes and Noss 1992, Angermeier and Karr 1994, Trombulak 1995), the protection and maintenance of biological integrity is the most logical choice as an overall conservation goal because it is the only goal that simultaneously considers all levels of biological organization (e.g., genes, species, ecosystems), the processes that link components of biological diversity (e.g., nutrient cycling, predation), and a consideration of the natural conditions within an ecosystem (e.g., the presence of native vs. exotic species).

Yet a goal is only useful in a management setting if it can be clearly defined, if one or more specific metrics can be identified to assess the success of management actions, and if the choice of metrics can be adapted to specific needs and economic constraints. I think some of the reasons that the concepts of "saving biodiversity" and "practicing sustainability" are so strongly resisted among many sectors of society is that it is not clear what these mean or how one would tell if it was being done.

I believe, however, that the concept of biological integrity can avoid these problems: it is clearly definable, it can be quantified, and the methodology for doing so can be developed in a cost-effective manner.

Biological integrity is not a new concept. It was first used as a goal for the Water Pollution Control Act Amendments of 1972 (33 USC §1251[a]), and has subsequently come to be defined as "the ability to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region." Although this definition in itself seems quite broad and unwieldy, it can be divided into basic elements related to the components of native biodiversity found in a region and the processes that govern the behaviors and interactions of those components over space and time. Specific elements related to biological integrity, adapted from Noss (1992), are:

1. All ecosystem types and successional stages should be represented across their natural range of variation.
2. Viable populations of all native species should be represented in natural patterns of abundance and distribution.
3. Ecological and evolutionary processes should be maintained.
4. The biological diversity in the region should be able to respond naturally to change.

Still, the concept is only useful in assessing ecological conditions of a region or the value of a particular management practice if it can be translated into a goal that can be measured. When a conservation goal is something as simple as "maximize the number of breeding pairs of Species X," the metric is obvious. As the goal becomes more comprehensive, such as "maintain biological integrity," the metrics become more complex.

Despite the challenges, however, Jim Karr, now at the University of Washington, has developed a useful index for assessing the biological integrity of an ecosystem (Karr 1981). The Index of Biotic Integrity (IBI) provides, among other things, a mechanism for measuring how well management or "non-management" actions are achieving the goal of biological integrity.

The development of an Index of Biotic Integrity for a particular ecosystem involves four steps:

1. Develop a list of metrics that can potentially be assessed in an ecosystem. Ideally, the metrics will assess conditions at all levels of biological organization, all types of ecosystem functions, and distinguish between natural and exotic elements in the system.
2. Choose study sites that are representative of the management activity being evaluated.
3. Choose one or more reference or control sites against which the study sites will be compared with respect to the metrics.
4. Establish a scoring system. For each study site, points are given for each metric with respect to how similar it is to the reference sites. *Often, three categories are used: identical or really close to the reference condition, only slightly different than the reference condition, and really different from the reference condition.* Scores for each metric are then summed to give a single index value. More points are given the closer conditions at a study site are to the reference sites, so the index value increases with the integrity of the system.

The maximum and minimum index values are the number of metrics times the maximum and minimum point score for each metric. All study sites can then be ranked with respect to these maximum and minimum values.

Calculated in this manner, the IBI suffers from two potential biases. First is the choice of the reference sites. The index will only indicate how different the study sites are from the sites chosen as references. If the references are themselves modified from desired conditions, then the index calculated will give an inaccurate absolute assessment of biological integrity. This bias is especially problematic in ecosystems where unmodified sites are not available to act as references. Yet it can be alleviated somewhat if (a) historical records of conditions are available and can serve to illustrate the reference condition, (b) sites can be identified that are greatly similar to ideal reference sites, and (c) the index is interpreted and reported as a relative, rather than an absolute, assessment of integrity.

The second potential bias comes from the metrics chosen. If the metrics overemphasize a particular aspect of biological integrity, such as trophic structure, then the calculated index will be more sensitive to differences between the study and reference sites in this metric. This problem can be minimized if an *a priori* framework for choosing metrics is established and evaluated for biases before being used.

To date, the use of an IBI has been almost exclusively limited to aquatic systems (Karr 1981, Karr and Dudley 1981, Lenat 1988, Miller et al. 1988, Ohio EPA 1988, Schlosser 1990, Karr 1991, Hughes and Noss 1992, Lyons 1992, Jackson and Davis 1994, Kerans and Karr 1994, Martin 1994, Minns et al. 1994, Lyons et al. 1995), reflecting the historical development of the concept with the Clean Water Act. However, the concept is equally applicable to and important for the management of human activities in terrestrial systems.

Trombulak Interview

Continued from preceding page

accompanying article for them. But it very much represents my thinking at this point on the development of a really useful, workable, implementable idea.

I take it as a compliment that after my talk I did not get a single comment from anyone that this was not workable, or that it was philosophically wrong, or that industry couldn't work with it. There was no immediate reaction from anybody that this wasn't something that could potentially be useful to all people who were interested in the long-term health of the region.

JS: That this could lead to something measurable, quantifiable, and therefore, not simply, "my value" vs. "your value"?

ST: That's right. This concept will never be a panacea, but its deficiencies are the exact same as those held by every other quantifiable measure we consider important: *Economic Health*: we often hear that industries need to be economically viable? But what's the measure of that? I don't expect any industry to give me an exact number of what it takes to be economically viable. I recognize that we're talking about relative values. *National security*: exactly how much money needs to be spent in order to have security, or how many weapons do we have to have in order to be secure? They're all relative measures.

So the index of biological integrity, as developed by Jim Karr, and as I develop it further for forest ecosystems, shares those flaws, and I acknowledge that. But we've managed to work pretty well in this country over the last couple of hundred years at achieving these relative measures of national security and economic health. I think the time has come for us to start thinking about ecological health in the same way and give it at least the same importance.

Table 1. The Compositional Attribute of Biological Diversity

The specific metrics suggested are divided among different levels of organization within the attribute. The list is not intended to be exhaustive; further work is planned to expand this list.

Genes

* The level of heterozygosity within native species
* The percent polymorphic loci within the native species

Species

* The number of native species
* The percent of exotic species and stocks
* The pattern of change in abundance of native species over time
* The population size of native species
* The number of species that have gone locally or globally extinct
* The total number of individuals

Communities

* The number and kinds of distinct communities and/or habitat types within the landscape

What I describe here, then, is a rough framework for the development of an Index of Biological Integrity for forested ecosystems. With specific reference to the debate over the future of the Northern Forest, for example, a primary source of tension is the role of ecological health in shaping Northern Forest policy. Conservation interests want ecological health to be taken seriously. Economic interests are reluctant to embrace management goals that cannot be defined or measured. The concept of biological integrity, especially the use of an Index of Biological Integrity, potentially satisfies both concerns.

This article represents a work in progress, and should not be interpreted as the final stage of development of this idea. I hope that this framework will stimulate honest discussion about using such a system to effectively incorporate consideration of biological integrity into the development of regional forest policy.

A Measure of Biological Integrity in Forest Ecosystems

The index of biotic integrity ought to encompass all dimensions of biological integrity. The framework that I use for this (Figure 1) is adapted from Noss (1990), who originally proposed this scheme as a description of the dimensions of biological diversity. Within this framework I suggest several metrics that can potentially be measured within a forested system. Metrics are distributed among three attributes of biological integrity—compositional, functional, and structural—and among more than one level of organization within each attribute (Tables 1-3). For levels below that of the species, metrics would ideally be measured for all species in the communities. Of course, this is impossible. In reality, a representative sample of species will be chosen, and the value of the Index to assessing progress toward and achieving biological integrity will be based on how representative the selected species are.

Clearly, not all of the metrics listed in Tables 1-3 are equally practical. For some specific applications, analyses must be done with existing data sets and supplementation with new metrics is not possible. For others, the cost of collecting the additional data may be prohibitive. Still, there is value in approaching the assessment of biological integrity in this manner. First, if there is still some flexibility in designing a data collection protocol or adaptive management plan, this framework may help establish priorities for data collection. Second, even if the metrics to be used are fixed or the data already collected, this framework helps identify potential biases and/or redundancies in the use of the data to assess biological integrity.

To use this framework to assess the biological integrity of a forested landscape, the following steps should be carried out:

1. Select the metrics for which data exist or can be collected. Effort should be made to select metrics from among all three attributes and all levels of organization.
2. For metrics with targets at the species level or lower, select the species to be used. Effort should be made to select species from among a broad range of taxa (e.g., angiosperms, mammals, insects), ecological types (e.g., herbivores, predators, detritivores), and habitats.
3. Select reference sites. If suitable sites do not exist or cannot be found, base comparisons on historical conditions. Effort should be made to use historical records that are as recent as possible (to control for differences due to natural climate change), but before major anthropogenic changes began.
4. Establish a point system. For simplicity, I recommend scoring 5 points if the study site is identical or really close to the reference condition, 3 points if only slightly different than the reference condition, and 1 point if it is really different from the reference condition.
5. Calculate the Index of Biotic Integrity for the study site by assigning the correct point score for each metric. This number will fall within a range from 5 times the number of metrics to 1 times the number of metrics.
6. Explicitly acknowledge the biases that exist in the Index with regard to the choice of metrics and the choice of reference sites.

This system of calculating the Index of Biotic Integrity can help determine the ecological consequences of a particular management action and act as a guide for the development of a long-term management plan for a site. For example, *a priori* analyses can be made of proposed actions with respect to their effect on the IBI. Obviously, the effect of actions on some metrics will not be certain before they are performed. However, common sense and a knowledge of the ecological literature will permit many accurate predictions. Also, *a posteriori* analyses can be done of management actions after they have been implemented to evaluate their appropriateness and success, and a system of long-term monitoring can easily be designed based on the data needed to calculate the Index. Many other applications are possible, and point to the value of using a clearly defined, quantifiable conservation goal for establishing natural resource policy.

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Table 2. The Functional Attribute of Biological Diversity

The specific metrics suggested are divided among different levels of organization within the attribute. The list is not intended to be exhaustive; further work is planned to expand this list.

Genetic processes

* The amount of gene flow from outside of the landscape
* The level of inbreeding
* The mutation rate

Demographic processes

* The per capita reproductive rate
* The per capita mortality rate
* The immigration rate
* The emigration rate
* The sex ratio
* The age distribution
* The percent of individuals that are diseased, deformed, lesionous, or tumorous

Community processes

* The percent of the species that are trophic or habitat generalists
* The percent of species that are trophic or habitat specialists
* The number of genetically intolerant or sensitive species
* The percent of tolerant or insensitive species

Landscape processes

* The size, intensity, and frequency of disturbance
* The net rate of soil production
* The pattern of change in soil chemistry
* The rate of change in habitat use or characteristics

Table 3. The Structural Attribute of Biological Diversity

The specific metrics suggested are divided among different levels of organization within the attribute. The list is not intended to be exhaustive; further work is planned to expand this list.

Population structure

* The percent of large, mature, or old-growth individuals
* The spatial and temporal fluctuations in all compositional and functional metrics

Habitat structure

* The percent of the waters within the landscape that are clean and fully supporting of it native species.
* The percent of the forests that have a heterogeneous structure, including light gaps.
* The degree of habitat fragmentation.
* The amount of downed woody debris.
* The density of snags.

Raw Log Export Restrictions: Major Criticisms & Rebuttals

Note: The following article is excerpted from "Getting the Cut Out: Raw Log Exports in the Northern Forest Region," by Northeast Natural Resource Center, National Wildlife Federation. To get a copy of the full report, complete with references, which have been omitted below, contact National Wildlife Federation, 58 State St., Montpelier, VT 05602, tel. 802 229-0650.

A series of criticisms directed toward policies to restrict log exports deserve consideration. The most significant literature on log export issues comes from the observations of developing countries which have experimented with bans, quotas, and taxes. Several of these countries have enacted log export restrictions in desperate attempts to control the environmental effects of over-harvesting and biological liquidation of remaining rainforest areas.

Economists have criticized the use of log export restrictions as an environmental policy in developing countries primarily due to the ineffectiveness of the policy or the unexpected side-effects to domestic industries and environmental quality. While these policies are seen to have the desired effect in limiting log exports, the criticism is that they frequently fail to grapple with underlying issues of insecure property rights, ineffective natural resource or social policies, high international demand for exotic tree species, the desire for foreign exchange, or the relocation of harvesting activities into equally environmentally-sensitive neighboring countries and regions. Critics of log export restrictions favor instead various types of production taxes (e.g. yield or severance taxes) that respond more directly to environmental problems created by poor harvesting practices.

Clearly the Northern Forest region differs in many key respects from the situation in tropical timber countries. Perhaps the most important difference is that the discussion of log exports in the Northern Forest region is dominated as much by local economic and job security issues as concern over an impending environmental crisis from the wholesale loss of critical species or biodiversity. To be sure, many people are concerned that the Northern Forest region is on the verge of another cycle—in this case an export-led cycle—of "high grading" due to the pull of rising prices on the international market. The concern has been noted, even within the forest products industry, that overall timber quality has declined in many parts of the Northern Forest. This concern is shared not only over the export of high quality hardwood logs but also the potential effect of a burgeoning world demand for lower quality fiber from the region. It is significant that both environmentalists and domestic wood products workers share a concern over raw log exports.

In the US., opponents of log export restrictions have argued that the expected economic benefits from export restrictions are overestimated, and that such benefits are offset by job reductions in the export economy. They also argue that export restrictions artificially reduce the value of logs and question the ability and willingness of log importers (particularly Japan) to shift demand—or modify their import laws and tariffs—to accept more processed or manufactured wood products instead of logs. Others emphasize the potential impact to landowners and their investments in forest management from reduced log prices that result from expected domestic supply increases under log export restrictions. Still others question why, under the economic theory of comparative advantage, states or regions should even try to develop their domestic processing sector in the face of global competition in wood products technology and consumption.

While several of these issues deserve more in-depth analysis, the following subsections focus on two reports which criticize raw log export restrictions. These two reports were selected for discussion (and rebuttal) because they are representative of the issues raised in economic and environmental critiques of log export controls.

Economic Criticisms of Log Export Restrictions

In evaluating log export policies from western US public forests, several reports by the Center For International Trade In Forest Products (CINTRAFOR) in Washington State argue that, from a global perspective, regional export and harvest restrictions may have both negative economic and environmental effects.[1] CINTRAFOR'S major conclusions, in **An Assessment of the Impacts of Recent Environmental and Trade Restrictions on Timber Harvest and Exports** are, with respect to log export bans in the western US., that reductions in global timber supplies will result in lost domestic market share and promote increased harvesting pressure in other regions, particularly those regions where sound forest management is not practiced. Environmental gains from log export bans are seen as potentially offset by environmental losses from increased harvesting in other regions. In addition, the report argues that regional log export limits undercut the domestic timber resource value due to the creation of a local over-supply situation that leads, in turn, to depressed stumpage values.

While the CINTRAFOR conclusions are compelling on the surface, they also raise several policy questions for discussion. One is the report's apparent assumption that US forest management is, or will inherently be, "more sustainable" than other forested regions of the world. This assumption supports a conclusion that domestic harvesting is always less damaging in the US than elsewhere. However, many forest ecologists would debate both the merits of such a comparison, and whether history supports the report's confidence in US. private or public forest management.

They might also question whether the US is even in the vanguard of practicing sustainable forest management. For example, firms in at least twenty tropical timber countries are involved in an internationally-accredited, peer-reviewed forest management certification program to stipulate that sustainable forestry is practiced based on the ecological characteristics of their region. While it is likely under current consumption rates that log export bans or limits will shift harvesting pressure to other regions, *it does not follow* that a net environmental decline will necessarily result, especially if the tradeoff is, for example, relatively scarce temperate old growth for relatively common plantation pine from Chile.

With respect to the second major issue regarding domestic economic effects, the report's central point is:

A ban on log exports, all other things being equal, will increase the domestic supply of logs. Since the increase in domestic supply decreases stumpage prices, log production from private and other public sources within the stumpage market will decline. As a result, log supply to domestic mills will not increase to the full extent of the log export restriction. The overall net effect however will be to stimulate processing of logs into lumber and plywood at home.

The report's model suggests that prevailing higher prices on the international market will cause a differential shift in demand for logs from other regions, notably the US South, Northeast, and Canada. From a pure commodity point of view and "all other things being equal," this is probably true. However, given the sensitivity of price and stumpage, conditions rarely remain "equal"—in the sense they are static—within the timber industry.[2] *The effect of a local over-supply condition may, in fact, be precisely what is necessary to encourage more sustainable forest management namely, a slower rate of harvest matched by higher value per unit of timber processed.* The qualitative difference embedded in the last sentence of the quote above which refers to the "stimulation" of domestic processing from export restrictions is especially important to local community development, labor, and environmental interests.

CINTRAFOR's estimate of regional response to export restrictions illustrates this tradeoff. According to the report's model, a reduction in sawlog exports of 1.2 million cubic meters (mcm) from export restrictions, is accompanied by a $0.60 per mcm reduction in price and reduction in sawlog production from private lands of 0.4 mcm (due to the lower price). This has the effect, however, of *increasing domestic sawlog processing* by 0.9 mcm. In turn, this enables the western region to *expand processed exports of sawnwood and plywood* by 0.4 mcm and 0.1 mcm respectively.[3] These domestic gains occur despite estimated price increases in other regions from the supply reduction on western lands.

The significance of this CINTRAFOR report to the Northern Forest debate is that it is one of the few regional analyses on the distributional effects of log export restrictions that has been done in the US. While the trade restriction in this instance is applied only to public lands, and is thus non-uniform in its impact on producers across the region, it provides insight on the kinds of effects of the most stringent export policy; an outright export ban. Although this report is most critical of environmental impacts associated with harvesting limits (not export limits), the research into probable effects from export restrictions demonstrates that *domestic processors may benefit from raw log export restrictions.*

Due to the focus on log restrictions on public lands, this report does not measure the direct effect on private landowners. However, the report's model shows that induced effects cause private landowners to decrease sawlog production due to lower stumpage values. Under this model this is offset, not necessarily proportionally, *by private gains in local processing.* Whether a similar scenario would unfold in the Northern Forest region is difficult to ascertain.

However, it is clear from this report that *public policy choice is a key driver* in forest industry behavior even though many economists view log export bans as an excessively blunt instrument. More carefully designed policies such as domestic processing incentives or export taxes can lead to a preferred scenario in the Northern Forest by increasing local forest products development without the "sticker shock" of export bans. A future which is left entirely to "open market" behavior may not sustain jobs or desired forest conditions. The discussion above points out the expected effects from the ban in the Northwest, and the tradeoff in gains between the export market and domestic mills.

Environmental Criticisms of Log Export Restrictions

Although environmental concerns about log export restrictions were noted in the discussion above in regard to the "transfer" of environmental impacts to

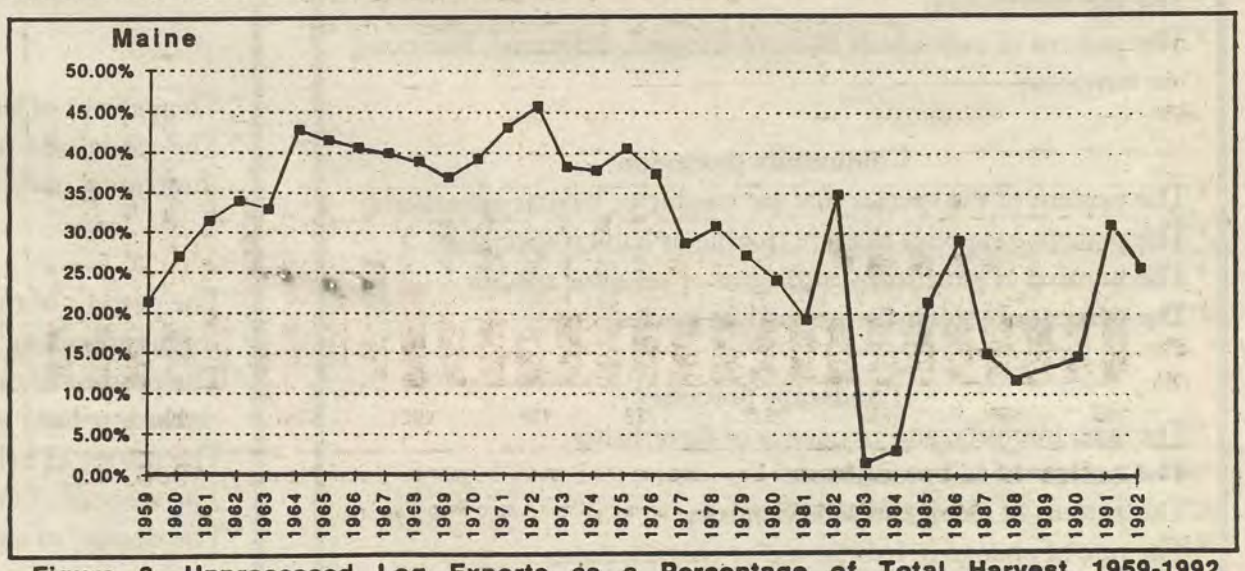


Figure 8. Unprocessed Log Exports as a Percentage of Total Harvest 1959-1992
Source: Maine Forest Service (Provided by David Fields, Univ of Maine, Orono)

other regions, a more frequent criticism against export restrictions in the Northern Forest is the defense of export markets as a necessary tool for forest management and stabilizing long-term tenures. This theme is a major conclusion of a Harvard Institute for International Development (HIID) report. In addition, and similar to the CINTRAFOR report, this report argues that log export restrictions depress the domestic price of logs (due to the increase in domestic supply) and thereby causes stumpage values to decline, stimulates processing over-capacity, leads to incentives to convert forest land to other land uses, and sacrifices sustainable forest management.The paper concludes that the environmental effects of reducing the value of wood through export restrictions may actually offset the benefits of value-added manufacturing.

While the HIID paper is oriented to developing countries with tropical species, it brings up several important questions regarding the link between exports and forest management. A key issue, for example, is how landowners and forest land managers respond to timber supply changes from export restrictions. Economic models suggest (assuming a static view of other factors of production) that export restrictions will depress domestic prices. However, at least two other important variables may affect this response.

One is the relative strength between domestic and international markets for sawnwood or other forms of processed lumber compared to unprocessed logs. In the US, this is typically measured by the strength of jobs and output in wood products manufacturing, housing starts, and other economic indicators. For example, housing starts as reported by the US Commerce Department rose nationally by 12% in March 1994, with positive but slower growth through the spring of 1995. In addition, Northeast regional stumpage markets have experienced dramatic growth in recent years. Industry analysts have suggested that price inflation due to generalized global scarcities account for much of the premium in stumpage markets. In the Northwest, rather than a loss in stumpage value as predicted by the model, private landowners enjoyed a boom in export and domestic markets leading some environmentalists to worry about the impact on marginal stands and future growing stock. The question remains open as to whether raw log exports in turn create enough of a domestic supply scarcity to support high stumpage prices for landowners in the Northern Forest and whether, conversely, export restrictions would necessarily depress both stumpage fees and the incentive to conduct sound forest management.

The second variable has to do with landowner expectations. In the face of potentially falling domestic stumpage prices from export restrictions, landowners may consciously withhold their timber from the market. This already occurs during periods of price volatility for two reasons. First, timber may be withheld because the landowner is a "big player" with an ability to influence local stumpage prices. This is the case in many small developing countries and in certain areas of the Northeast (such as large industrial ownerships in Maine) or large-scale leaseholders in Canada. Second, timber may be withheld in anticipation of higher future prices. This second reason is also probable in the Northeast given the higher percentage of dispersed private, non-industrial lands which are not managed on a primarily timber commodity-output basis, and where there has been a steady demand for certain species such as hard maple or white pine.

Logs and jobs on the move. Logging truck headed into Canada, north of Jackman. Photo © John McKeith

Nonetheless, the primary environmental criticism of the HIID paper against export restrictions is that "...log exports restrictions artificially...create an illusion that wood is still abundant [domestically]..." and therefore accelerate harvesting, land conversion, and environmental damage. In order for this to be true, however, landowners and mills would have to remain price-insensitive to the changes in supply created by the restrictions. Whereas this situation may be true in developing countries where few large, frequently state-sponsored companies are responsible for much of the timber harvesting activity, this concern does not necessarily translate to many parts of the Northern Forest where the size and types of firm are more heterogeneous and market conditions are comparatively more open. In addition, given the shifts in global and national wood markets as explained in Section 2, some Northeast processors are finding new markets in the western US and other domestic locations for processed wood.

A final issue raised by the HIID paper, and one that has been reiterated by some forestry consultants in the Northeast, is the importance of raw log export markets in protecting or promoting investments in forest management. They suggest that high stumpage prices in the export markets provide a critical incentive for better forest management. The HIID paper similarly emphasizes that with log export restrictions, "...too much processing capacity develops, too much forest is converted to other uses, and too little management occurs on the remaining forest." In the Northern Forest this may be true in some instances, but it is very difficult to prove or disprove that export prices are the *dominant factor* in landowner decisions about forest management.

A variety of other factors come into play, including:

- Overall land ownership and timber management goals;
- The expected future value of stumpage;
- Effect of state and federal tax codes on income and the contribution of state and local property tax stabilization programs;
- The strength of alternative non-forest land investment opportunities;
- The level and cost of forest management required;
- The strength and availability of low quality wood markets, e.g. chips or pulp; and,
- The changing configuration of processed wood markets and the needs of regional mills and manufacturers.

Alternative investment opportunities are especially relevant since, following a timber sale, the capital value of the timber *is now liquid,* and depending on the goals and interests of the landowner, may be forwarded to a range of alternative investments unrelated to timber land management. This is particularly true for parcels where a high proportion of the most valuable growing stock has been harvested—typically large diameter logs—and where the next major cutting cycle is many years away. On this issue, the HIID paper ends with a pointed disclaimer by noting that, *"...permitting log exports does not guarantee that stumpage values will be high enough to financially justify the retention of forests or investments in forest management, it does improve the chances."*

It is an open question as to whether "the chances of improved forest management" as suggested by HIID are widely supported by export-induced stumpage in the Northern Forest region. In fact, it is unclear whether a direct causal link can even be established between export stumpage and forest management, or forest conservation. The contribution appears to be marginally beneficial compared to the potential local and regional economic losses from log exports. The positive value of the log export-forest management relationship is best argued where export stumpage represents the *only* market available *and* where export returns are critically necessary to retain forest land ownership. However, these circumstances typically do not lend themselves to meeting long term forest conservation goals.

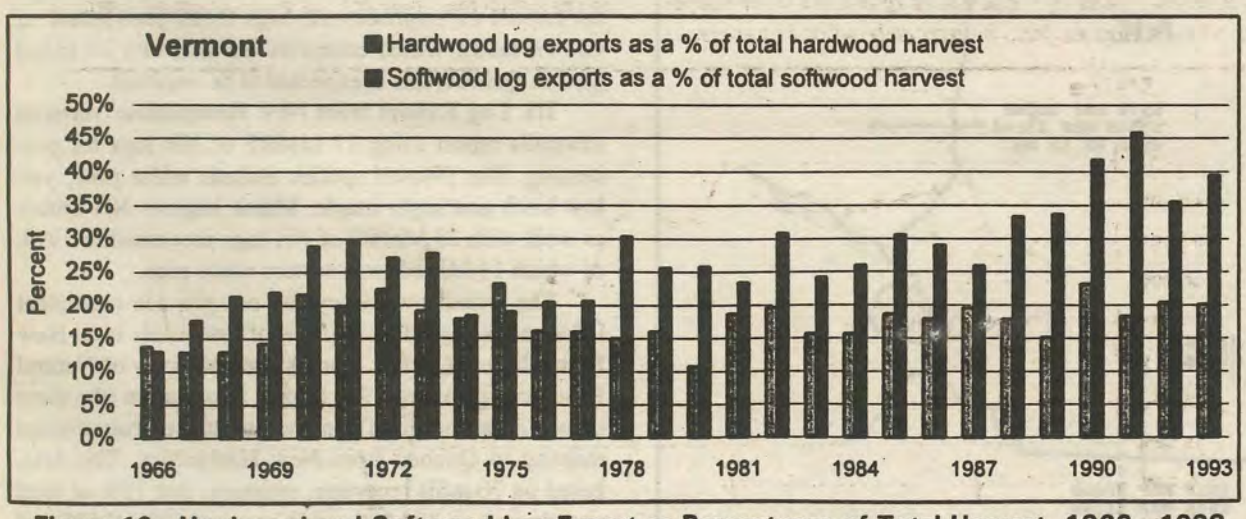


Figure 10. Hardwood and Softwood Log Export as Percentages of Total Harvest 1966 - 1993
Source: Vermont Dept. of Forests, Parks and Recreation

Footnotes

[1] Perez-Garcia, *An Assessment of the Impacts of Recent Environmental and Trade Restrictions on Timber Harvest and Exports* (1991); H. Lippke, *Timber Price and Trade Impacts from Declining USFS Sales and the State Log Export Ban: An Analysis of Changing Export Markets* (1993); Perez-Garcia, *Global Forestry Impacts of Reducing Softwood Supplies from North America* (1993); H. Lippke, *The Economic Effects of the Forest Resources Conservation and Shortage Relief Act on Timber Prices* (1994); Perez-Garcia, H. Lippke Fretwell, B. Lippke, and X. Yu, *The Impact on Domestic and Global Markets of a Pacific Northwest Log Export Ban or Tax* (1994).

[2] Johnson et.al. (1995) has suggested that "export demand for high quality timber may be less elastic (less sensitive to a change in price) than the domestic demand" and that even with export controls, the US. can still influence export markets.

[3] Table 4: Impact summary for the trade restriction scenario for the year 1995 (Perez-Garcia 1991).

Survey Finds 31% of New Hampshire Logs Are Exported Unmilled

Ed. Note: The New Hampshire Forest Inventory Project released its "Results of an Interim Forest Inventory of New Hampshire's Timber Resource" in September. The inventory contains four sections: I: White Pine/Red Oak Interim Inventory, 1994 vs. 1983; II: Department of Revenue Assessment Report-of-Cut Harvest Volume Data, 1983-1993; III: Interstate/International Unprocessed Timber Flow; and IV: Timber Availability. We reprint section III below. To get a copy of the full report, contact the New Hampshire Timberland Owners' Association, 54 Portsmouth St., Concord, NH 03301

Introduction

The objective of the NH Wood Flow survey was to quantify the movement of sawtimber in and out of New Hampshire to adjacent states and Canadian provinces. The questions the survey sought to answer are, "How much sawtimber harvested in New Hampshire is processed by New Hampshire wood product manufacturing industries, how much leaves the state in an unprocessed form, and how much is imported by New Hampshire wood product manufacturing industries?"

This report provides a "snapshot" in time (early 1995) that allows the comparison of present data with past data, and provides estimates of the best available information on sawtimber flow into and out of the state.

New Hampshire has 92 active sawmills, 35 of which produce over 3 million board feet (MMBF) of lumber per year. Eleven of NH's sawmills produce in excess of 10 MMBF of lumber per year. The number of commercial stationary sawmills has remained fairly stable since 1974, with 100 reporting at that time.

Methods

The woodflow survey was conducted as a cooperative effort between the Vermont Department of Forests, Parks and Recreation and the NHFIP (Forest Inventory Project). The survey was conducted by mail. It was a voluntary, confidential survey designed to determine the volumes, species and sources of harvested timber processed by the mills in 1994. Vermont has many years of experience in conducting woodflow surveys gathering data from over 500 primary processing mills throughout New England and Quebec. New Hampshire's participation strengthens the data and provides the opportunity to collaborate in the analysis.

Over 500 primary processing mills were surveyed in New England and Quebec. The NHFIP surveyed 99 primary processors in New Hampshire to determine the flow of unprocessed timber within the State. The Vermont Department of Forests, Parks and Recreation surveyed mills outside of New Hampshire to determine how much timber is flowing from New Hampshire and Vermont to other places.

The completed New Hampshire surveys were returned to the UNH Cooperative Extension office. A follow up survey was mailed to non-responding mills to increase the response rate. A second follow up was performed by telephone. The 95% response was as follows:

- 78 returned survey
- 9 responded to telephone follow-up with data or estimates
- 5 mills did not respond (all small mills <100 MBF per year ann. production)
- 7 mills were no longer in operation (all small mills < 100 MBF per year ann. production)

The final data set was sent to Vermont for tabular compilation. The results were returned to the NHFIP for synthesis and interpretation. In addition, more refined data regarding the movement of sawtimber from New Hampshire into the State of Maine was obtained from the Maine Forest Service. The estimates of the amount of sawtimber and other products flowing from NH to Canada (Quebec) are based on 1992 data provided by the Quebec Ministry of Natural Resources. Quebec mills are required to report, when known, the source of all logs processed. Seventy Quebec mills reported information to the Ministry in 1992.

In addition to mill consumption data, each New Hampshire sawmill was asked to respond to eight general questions about their business. Mill managers were asked to assess their longevity in the business, use of NH timber, perceptions of quality of timber, as well as plans for the future.

Results

I. Mill Production: Total NH mill sawtimber consumption for all species is reported at 273 MMBF, an increase of 8.9 percent from the 1982 sawtimber consumption figure of 243 MMBF. NH may have slightly fewer sawmills than in 1974, but they are procuring more timber. This is due to expanded capacity, primarily among the larger sawmills, and increased efficiency in the breakdown of the log into solid wood products. In the last few years, many of NH's larger mills have installed thin kerf band mills—many with multiple heads. Of those surveyed, over 50 percent of responding sawmills reported an increase in production within the last five years.

The increase in total mill production, and related sawtimber consumption, is primarily among white pine sawmills. White pine sawtimber consumption has increased 10 percent from 1982, from 155 MMBF to 172 MMBF. Strong demand in the early 1990s resulting from the upset in West Coast pine supply resulted in some strengthening of eastern white pine markets. Coupled with a strengthening economy and increased home building, the demand for white pine is forecasted to remain steady in the foreseeable future, although markets have dropped in mid-1995.

Red oak production decreased as a percentage of the total lumber production from 10 percent (24.3 MMBF) in 1982 to 8 percent (21.8 MMBF) in 1994. Reasons explaining the decrease include: increasing red oak sawmill capacity outside NH, mills switching back to white pine from mixed species sawing, mills sawing a greater variety of hardwood species, and greater competition for red oak logs.

II. Origin of Sawtimber for NH Forest Industry: The survey asked NH mill managers to generally describe where their logs come from. Some of the mills could provide very precise information; other mills could only provide rough estimates on log source. In general, the larger mills that represent the majority of production in NH were very knowledgeable about the source of the logs consumed at the mill.

NH's sawmills are concentrated in central and southern NH. Although the majority of logs supplying these mills are procured locally, logs move great distances within this region. It is not uncommon for a mill in Grafton County to procure logs from Hillsborough County or vice versa. Competition, price and trucking opportunity are major factors influencing log flow.

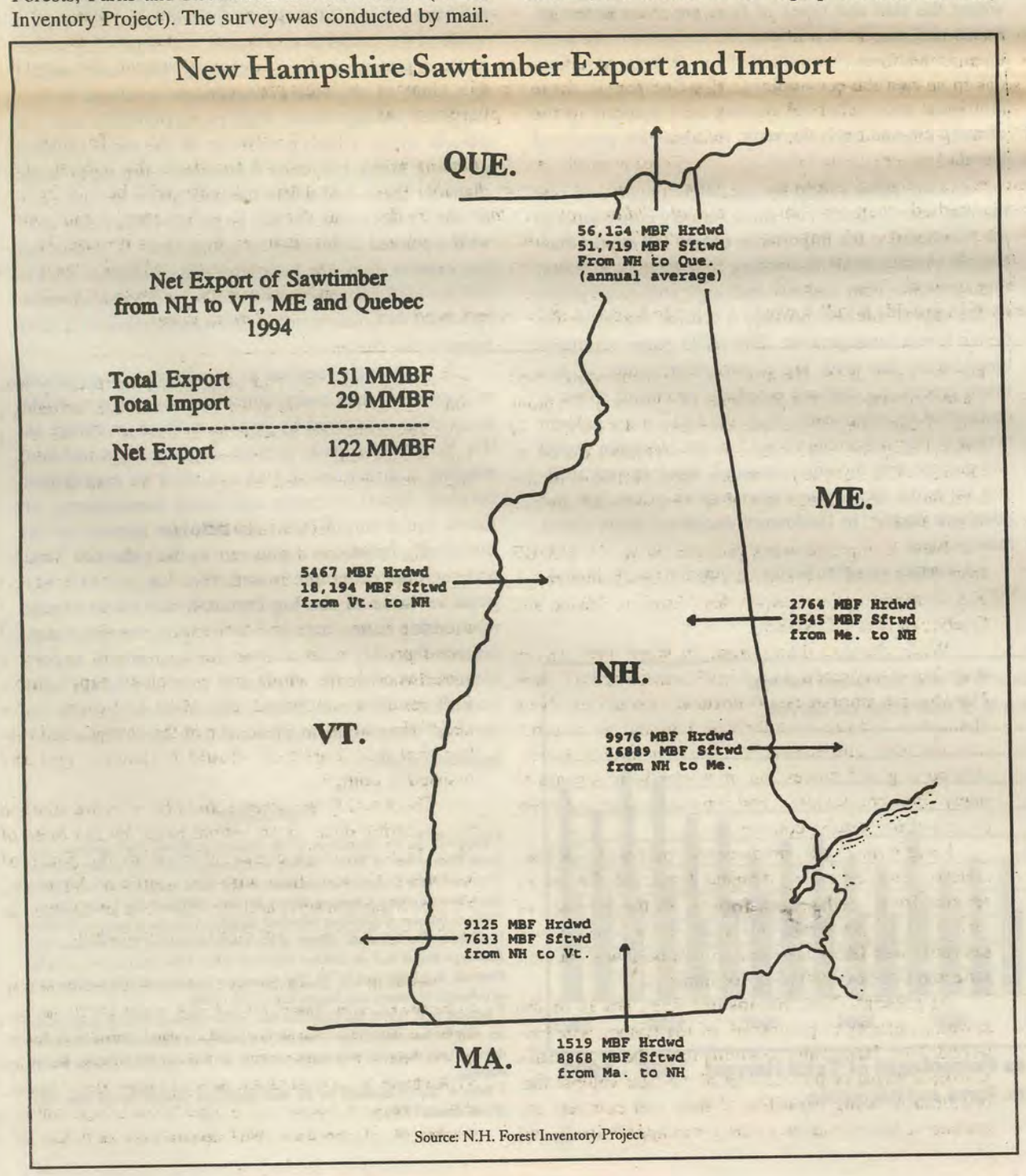
Many of New Hampshire's sawmills procure logs from surrounding states.

Nearly 40 MMBF of logs are imported into NH for processing. Vermont, Massachusetts and Maine contribute the majority of this volume, with 23.7 MMBF, 10.4 MMBF and 5.4 MMBF, respectively. Minor amounts enter from New York and Connecticut. The survey did not document any log import from Canadian provinces to NH mills, but due to restrictions on export of unprocessed logs from provincial or Crown lands, which comprise the majority of forest land in Quebec, this is expected to be minimal.

III. Log Export from New Hampshire: Vermont sawmills report using 17 MMBF of NH logs for processing. The favored species include white pine, yellow birch and sugar maple. Maine imports NH timber as well, with 28 MMBF of NH logs processed in 1994, of which 14 MMBF was eastern white pine.

The woodflow survey did not provide consistent information regarding the flow of sawtimber from New Hampshire to Quebec. The Quebec Ministry of Natural Resources provided 1992 import information (the most recent data compiled) on the amount of roundwood moving to Quebec from New Hampshire. The data, based on 70 mills reporting, estimates that 70% of total roundwood or 375,508 cubic meters (108 MMBF) of sawtimber processed by Quebec mills was reported to have originated in New Hampshire.

IV. General Questions: The following are



Source: N.H. Forest Inventory Project

Northeast Forest Congress Produces Status Quo Vision Statement

In Durham, New Hampshire on December 10-12, the Northeast Forest Congress convened in advance of this February's Seventh American Forest Congress to be held in Washington, DC.

Gatherings such as these are an often uneasy mix of industry, government, academics and environmentalists with differing assumptions about forests. The question that arose in Durham was whether it were better to have honest airing and representation of disagreement or to do the 1990s thing of "vision and consensus." Although we do not disparage finding consensus on principle, we do not support cloaking the conflict of ideas in New Age mumbo-jumbo, either.

Many of us in attendance at Durham felt the results spoke for themselves. Although we valued some of the panel presentations such as Steve Trombulak's model for assessing biological integrity (see pages 19-23 for an interview with Professor Trombulak followed by his article on an index of biological integrity) and many of the hallway conversations, the premise that The Northeast Forest Congress's vision represents a dynamic consensus of all participants is not supportable. However, for our readers' sake, we present the "consensus document' (presented below in regular type) along with a version that perhaps represents another consensus of those who found themselves in a progressive minority in Durham (presented in italicized type).

—Andrew Whittaker

A bird's eye view of part of the 1800-acre clearcut in Whitefield/Twin Mountain, NH. This privately owned tract has been managed in accordance with criteria determined by the landowner. An educated citizenry in NH has experienced this legal clearcut, but is not enjoying the natural and spiritual values of the liquidated forest. Photo © John McKeith

The Draft Vision For Northeastern Forests For the Next 50 Years

The Northeastern forests will be comprised of a rich mosaic of predominantly privately owned lands managed in accordance with criteria, determined by the landowners, for a broad range of ecological, economic, social and spiritual values and benefits.

The Northeast forests will be comprised of a rich mosaic of public and private lands which, where managed, are done so in accordance with criteria supported by the community, for ecological, economic, social and spiritual values and benefits.

When location, size, and timber resources permit, the forests will be cared for so as to sustain the economic health of the communities where they exist. All forests, public and private, of whatever size and wherever located, will be managed, in accordance with the best scientific methods then available, to insure the integrity of natural processes, provide diverse habitats, and guarantee long term ecological health. These forests will provide a full range of options for future generations.

The forests will sustain the well-being of surrounding communities. To the extent forests are subjected to human management, the integrity of natural processes, biotic integrity and diversity of habitats will be assured at both the stand and landscape levels.

In appropriate cases, certain portions of forests in the public domain will be set aside and preserved as wilderness.

Forests in the public domain will form the core of a comprehensive system of wildland reserves that insure the perpetuation of evolutionary destiny of forests and forest species.

The forests will be experienced and enjoyed by an educated citizenry who understand and appreciate the economic, natural and spiritual values of the forests and who respect the practices applied to their health and maintenance.

An educated citizenry will play an active role in preserving the economic, natural and spiritual values of the forests by participating in the public policy decisions that guide the gamut of forest practices.

Public policies affecting the Northeast forests at the federal, state, and local levels will be integrated, applied in a well-reasoned and consistent manner, arrived at through participatory democracy, and based upon facts and fundamental scientific principles.

We'll drink to that.

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responses to general questions asked of each New Hampshire sawmill. The results indicate a mature and relatively stable industry.

The average sawmill has been in business 35 years. Thirty-seven percent have been in business more than 35 years and 14 percent less than 10 years.

Fifty percent of the responding mills have increased their use of NH timber in the last 5 years, 11 percent have decreased their use and purchased volume at 39 percent of mills have seen their use remain the same.

Seventeen percent of responding mills said that the quality of NH timber has improved in the last five years. Twenty-four percent said that quality has decreased, and 39 percent report it has stayed the same.

Forty percent report an increase in lumber production in the last 5 years. Fourteen percent have decreased lumber production and 37 percent have maintained lumber production at steady levels.

Eighty-one percent of the mills report that their future plans depend on the availability of New Hampshire timber. Many of the written comments reflect a concern about logs moving to Canada.

Discussion

The results of the wood flow survey indicate that New Hampshire's sawmill industry is strong and increasing in total manufacturing capacity.

Increasing competition for logs, expanding procurement zones, and historically strong regional markets all contribute to significant movement of sawtimber between New Hampshire, adjacent states and Canada (primarily the Province of Quebec). Vermont and Maine sawmills alone consumed 43 MMBF in 1994. Using the 1992 estimate of sawtimber export to Quebec (108 MMBF), a rough approximation of the total movement of logs to Maine, Vermont and Quebec is 151 MMBF.

New Hampshire mills procured some 29 MMBF from Maine and Vermont in 1994. Therefore a rough approximation of net export for Vermont, Maine and Quebec only is 122 MMBF.

While the data drawn from the wood flow survey may be interpreted as a significant loss of New Hampshire unprocessed natural resources, New Hampshire benefits by a thriving regional wood products industry. The economic impact of the harvesting, transporting and processing of timber is significant to many rural communities and represents a major component of the state's economy.

Long-term market predictions world-wide indicate a steady and increasing demand for sawtimber of all species from northeastern forests. In the absence of new restrictive trade policies, New Hampshire sawmills will likely continue to compete with out-of-state and out-of-country log consumers.

At present, New Hampshire does not have the sawmill capacity to process all of the timber now harvested. New Hampshire sawmills have the opportunity to expand capacity by intercepting harvest volume that is currently being exported, if they can compete in: gaining access to timber, pricing logs aggressively, and efficient processing and utilization. In recent years, many New Hampshire sawmills have made substantial investments in new processing technology. However, it may be difficult to overcome all competitive advantages, real or perceived, enjoyed by Canadian mills.

Recommendations

The 1994 wood flow survey was the first attempt at a cooperative survey with the State of Vermont. As such, the survey tool and methods need to be refined to produce better data and to include a wider range of wood products, including: hardwood and softwood roundwood pulp, whole tree and clean paper chips, mill residues, cordwood, etc. Mills that do not now keep information on the source of the unprocessed timber that they purchase should be encouraged and assisted in doing so.

The wood flow survey should be a formal method for gathering data, on an annual basis, by the State of New Hampshire in cooperation with the State of Vermont. Cooperation with the states of Vermont, Maine, Massachusetts and the Province of Quebec is critical to obtain accurate regional information.

Section III was coordinated by Sarah Smith, University of N.H. Cooperative Extension, Durham, NH, and Ralph Arnold, TIMCO, Inc., Ctr. Barnstead, NH. Additional analyses and assistance provided by Robert DeGeus, Vermont Department of Forests, Parks and Recreation, Waterbury, VT; Jim Blanck, Maine Forest Service; and Sylvain Martel, Quebec Ministry of Natural Resources. Assistance also provided by Gigi Laberge, HHP, Inc., Henniker, NH; and Joanne Baron, UNH Cooperative Extension, Durham, NH

Book Review

Losing Ground: Mainstream Environmentalism in Crisis

Reviewed by Jamie Sayen

The mainstream environmental movement is in deep trouble. Membership is declining; demagogues of the Right are attacking it relentlessly; and Congress, whether controlled by Democrats or Republicans, largely ignores its pro-actice agenda. Grassroots activists despair over the manner by which the mainstreamers ignore, and sometimes undercut, their efforts in affected communities. Why?

Mark Dowie's important book **Losing Ground: American Environmentalism at the Close of the Twentieth Century** (MIT Press, 1995, $25 hardcover) offers a depressingly revealing insight into the crisis with the mainstreamers. Dowie's book is essential reading for those of us who want the full spectrum of environmentalism to succeed—from the major national groups to the smallest grassroots group. (A cautionary note is necessary: This is one of the most wretchedly edited books I can ever recall. There is a misspelling or a mistake on nearly every page. Nevertheless, despite the inexcusable editing, the book tells an important story.)

Dowie focuses his attack on the so-called "Third Wave" of environmentalism. The First Wave occurred a century ago in the age of Theodore Roosevelt, an era of land and wildlife conservation. The Second Wave was launched by Rachel Carson's **Silent Spring** and culminated in landmark legislation banning pollution of land, air and water. The Third Wave has focused its energy on lobbying and compromise. Dowie lists its buzzwords: "market-based incentive, demand-side management, technological optimism, non-adversarial dialogue, and regulatory flexibility." Third Wave "constructive engagement" has shifted the battle from the courtroom to the boardroom, thereby producing the "institutionalization of compromise."

Third Wave environmentalism seeks to control pollution levels rather than banning them outright. After all, Dowie notes, banning toxics outright is viewed as socialism in the United States, and the mainstream groups don't want to be perceived as opposing the American economic system, including its national religion of economic growth-at-any-cost.

Dowie indicts the direct mail dependency of big groups at the expense of citizen activism. He is critical of the impact of lawyers, scientists and lobbyists on the passion of the movement. Focus has shifted from the mountains, rivers and forests to an inside the beltway strategy. Besides, industry can outspend environmental lobbyists by a factor of ten to one.

As an example of Third Wave environmentalism that has had deleterious impacts on the Northern Forest region, Dowie cites the use of "pollution credits." Eastern utilities have sold pollution credits to midwestern utilities with the result that more acid rain is falling on the Northern Forest region.

Dowie sees Third Wave environmentalism as "essentially anti-democratic." Grassroots activists, with their "strong belief in the right of citizens to participate in environmental decision-making" are too often frozen out of the process by these Third Wavers. I can testify from first hand experience just how frustrated citizen activists in the Northern Forest region are with mainstream groups. They feel they are not taken seriously by members of the Northern Forest Alliance—and, too often, they are right. One Alliance leader once told me that Mitch Lanksy, author of the indispensable **Beyond the Beauty Strip**, and director of our Low Impact Forestry Project, "has no credibility." The exact same words had been used by a public relations officer of a paper company with mills in Maine to dismiss Mitch.

Dowie is no mere carper. He sees exciting evidence that the salvation of environmentalism will come—indeed, is already coming—from a Fourth Wave of grassroots citizen activists fighting for wilderness, against toxics, for environmental justice. He distinguishes grassroots activists from Third Wavers by their "strong belief in the right of citizens to participate in environmental decision-making." In Dowie's words, the Fourth Wave calls "upon science not to prove or defend their arguments or scenarios, but to demystify nature and explain ecology."

But, Dowie cautions, the Third Wavers have too often moved to co-opt grassroots efforts such as the "environmental justice" movement. Instead of coming to the support of the many diverse community environmental justice groups, the big mainstream groups, upon discovering that the funding community was interested in environmental justice, immediately rushed bloated funding proposals to the environmental foundations.

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If we are ever going to secure the protection of the natural and human communities of this region, there must be productive collaboration between the grassroots activists and the mainstreamers. We need each other. Neither group can achieve success without the other. If the mainstream groups would collaborate in a respectful manner with the community activists; if the mainstreamers would offer their services to the grassroots community; if the mainstreamers would stop worrying about their god-forsaken "credibility" and start worrying about results; then a united front of citizens and professionals could begin an unstoppable campaign for what is ecologically necessary, not for what an elite cadre of policy wonks has deemed politically expedient.

The Northern Forest environmental community has been bitterly divided over the proposal by Kenetech to build windmills in the Boundary Mountains of western Maine. Energy experts, without consulting grassroots activists in the region, not only signed on to support the massive development scheme, but signed a gag order that prevents them—and, as it turns out, the entire Northern Forest Alliance—from criticizing this ill-conceived project, that, as Pamela Prodan reports on page 17, appears to be falling apart. Mark Dowie's **Losing Ground** *documents all too many similar cases where the experts have ignored the grassroots—with disastrous consequences. He also outlines a strategy in which mainstream groups work respectfully with citizen activists, instead of working at cross purposes. Drawing by Pamela Prodan*

Every Time I Compromise I Lose
Quotations from Losing Ground

"There has always been something very safe and unthreatening about conservationists... [R]arely have they challenged the fundamental canons of western civilization or the economic orthodoxy of welfare capitalism—the ecologically destructive system that gives the nation's resources away to any corporation with the desire and resources to develop them." (page 28)

"At the heart of the mainstream movement's folly is an abiding faith that legislation backed up by litigation will adequately protect the environmental health of the nation." (p. 65)

"Let the people we pay to compromise—the legislature—do the compromising. . . . Every time I compromise I lose." David Brower **For Earth's Sake** (page 75)

"When government and the environmental movement both play mediatory roles and compromise on environmental issues, it is left to "radicals" to create the extreme position to counter the mega-technological position, be it preservation of pristine wilderness or a toxic-free world. Between two such extremes some degree of environmental protection can, hopefully, be brokered through compromise. But when radicals are excluded from the process, as they are by both government and mainstream environmentalists, there is no extreme against which to negotiate. Government, polluters, and environmentalists are then negotiating in relative harmony. The result is scant progress." (page 77)

"No major advances for rights or liberation have been made, or progress sustained, by legislation alone. In fact, passage of a landmark bill was often but the culmination of a prairie fire lit by abuse or injustice and fanned by massive public protest and direct action into real progress." (page 88)

"The intention of third-wave environmentalism is to protect the environment while preserving economic prosperity and price stability. But the hidden costs of cheap lumber, cheap energy, and cheap gasoline are acid rain, vanishing and extinct species, loss of arable farmland, and future generations of deformed children. Not until those 'externalities' are dealt with in an open and democratic way will third-wave incentives make sense." (page 123)

On Environmental Justice: 'In a nation built on notions of equal opportunity and equal rights, the environmental imagination must include the premise that the environment belongs to us all; that we share equally its life-sustaining attributes and whatever degradation we impose upon it. (page125)

"If the environmental lobby, with its 25 years experience in Washington could not affect a Democratic Congress and a rhetorically friendly Democratic administration, it may never be effective again." (page 192)

"If American environmentalism is to remain a vital force in the next century it will be because its leaders return to the fundamentals of the original movement, recoup some of the passion lost during the previous three decades, and create a dynamic working vision of environmental recovery." (page 225)

Book Review

Hope, Human and Wild: True Stories of Living Lightly on the Earth

by Bill McKibben, Little Brown and Company, 1995, $22.50 hardcover.

Reviewed by Jamie Sayen

Bill McKibben has written a very important book that offers concrete examples of how humans can live more gracefully, less wantonly on Earth as we enter the 21st century, which almost certainly will be known as the "Age of Limits." Residents and friends of the Northern Forest should be especially grateful to Bill for profiling past and potential ecological—and cultural—recovery in the Northern Appalachians and the Adirondacks. Unfortunately, some critics—notably Richard Bernstein and William K. Stevens of **The New York Times**—seem to be unable to grasp the book's important message.

Before I discuss the central themes of book, I must issue a disclaimer. I am biased in favor of this book both because of its message and because the author says very kind things about the **Forum**, me, and the people and groups that we work with. He calls the **Forum** "a new periodical of great value." Accordingly, this review will attempt to focus on McKibben's notion of hope and some of the more disappointing critiques.

Six years ago McKibben published a best-selling book with the depressing title of **The End of Nature**. The book was the first popular work on the greenhouse effect and global warming. At the time, critics hammered McKibben for his excessive pessimism. Unfortunately, just about every prediction in **The End of Nature** has been borne out by independent scientists in the past six years.

Today, critics, such as the reviewers of the **Times**, mock McKibben for his naive optimism. I believe a more careful reading of **Hope** will dispel those charges.

Following the publication of **The End of Nature**, David Brower challenged McKibben to write a book about "renewal, recovery, restoration." McKibben rose to the challenge by profiling three very different places, widely separated by geography, culture, and tradition: his home region of the Adirondacks—and the greater Northern Forest region, the model Brazilian city of Curitiba, and Kerala, a state in southern India. Each has a different story to tell.

Collectively, these communities offer tangible hope that we humans can indeed change our unsustainable ways. They do not offer any quick fixes; nor do they offer solutions that will be convenient for those who believe that their birthright—not to mention property right—permits them to live as selfishly, as wantonly as they desire. But, to those with a sense of generosity, with an abiding concern for the welfare of their children, grandchildren, and their grandchildren, these three examples demonstrate that we can effect changes that will improve our lives and our chances of surviving the ecological crisis of industrial civilization.

McKibben is careful not to draw simplistic conclusions from these stories. Rather, he writes: "These examples fill me with hope. Not hope that environmental damage can be averted; it's too late for that. But hope that such damage can be limited and contained during the next few crucial decades, and hope that we can in some measure recover."

The recovery of the forests of the Adirondacks in the last century offers hope that damaged natural and human communities can recover. Photo is of Spring Pond Bog and an esker in the Boreal Heritage Reserve in the Adirondack Park. Photo © John McKeith

He goes on to contrast this sort of hope with the current crop of "Ecopollyannas" (Dave Foreman's term), such as Gregg Easterbrook who have misrepresented the data to "prove" that things aren't as bad as they are. This is not "hope" McKibben writes, "that's wishing. Real hope implies real willingness to change. . ." He readily concedes that his ideas are "out of step with the politics and economics of the moment." But he suggests that "our politics is—temporarily—out of step with the chemistry and physics of the earth."

The first and fourth sections of **Hope** profile the Adirondacks and the Northern Forest. McKibben celebrates the recovery of forests in the Adirondacks after they were leveled in the latter stages of the nineteenth century. Despite claims by his critics, he does not romanticize this recovery. He acknowledges that the recovering forests of the Adirondacks and the White and Green Mountain National Forests are still missing the full complement of native species, that the forests are not yet old growth (he calls them "new old growth"), and that in certain ways, these recovering forests will never quite recover to their former conditions. Further, he acknowledges that all our well-intentioned efforts to preserve wilderness through such provisions as Article 14 of the New York State Constitution may be doomed in the face of global warming, acid rain, the invasion of exotic pests and viruses, and other anthropogenic assaults on our natural systems.

We are right to be depressed by the environmental crisis, but, McKibben argues, "...I no longer think fear is sufficient motivation to make such changes, especially since they involve the most fundamental aspects of our economies, our societies, and our individual lives. To spur us on we need hope as well—we need a vision of recovery, of renewal, of resurgence."

The second section of **Hope** features Curitiba, a major city in the mountains of southern Brazil. While it has its share of poverty and other problems associated with Brazilian cities, it is a city that, to an astonishing degree, works. Its public bus system handles more riders that the bus system in New York City. The system is fast, clean, beloved, and it reinforces healthy community living, instead of undermining it. The bus system, like the downtown city, and public housing, has largely been designed by civic-minded architects instead of the customary political cronies who control most cities. Recycling, neighborhood communities, and the plight of street children, have all been addressed by creative politicians and involved citizenry. The rich and the poor generally live together, not in separate ghettos. There are clean healthy places for children to play in their neighborhoods; there is a pedestrian shopping district in the downtown; the streets are quite safe.

McKibben's profile of Curitiba is upbeat, but he doesn't claim that Curitiba has solved all its problems; nor does he preach that we in America ought to become carbon copies of Curitiba. Rather, he argues, that there are ways we can develop in our own cities that will make them more livable, more ecologically benign, and that the solution to urban problems is not always to simply throw money at a problem. Curitiba, with its relative lack of wealth, with its huge population, with its common sense and humane approach to problem-solving, offers us an inspiring model of what is possible, if only we can summon the communal political will.

Kerala is a state in southern India about the size of Vancouver Island. It is desperately poor, even by the standards of India. Per capita income is about $330 per year, or 70-times less than US per capita income. And yet, average life expectancy is about on a par with the United States. Kerala has a 100% literacy rate. Its birth rate is somewhat higher than the United States' (18 per 1000 versus 16 per 1000), but is falling faster than the US birth rate. The figures for all of India are: life expectancy of 58 years, a birth rate of 40 per 1000, and literacy rates of only about 50% (much less for women). Kerala, McKibben writes, "undercuts so many maxims that we consider true, consider almost intuitive. Richer people are healthier; richer people live longer; richer people have more opportunity for education. Richer people have fewer children. In order to improve human lives we need large-scale economic growth."

McKibben's point is not that we of the West ought to emulate Kerala's poverty. It is, rather, that Kerala puts the lie to our most sacred assumptions about economic growth and material wealth as the solution to social and cultural—as well as ecological—problems. He suggests that somewhere between the US per capita and the Kerala per capita income we can provide for important quality of life values without falling for the mantra of economic growth, which is really a prescription for ecological calamity *(see the interview with Donella Meadows in the previous issue of the **Forum**, vol. 4 #2)*.

One other critical point that seems to have eluded the **Times** reviewers is that McKibben is not offering Curitiba, Kerala, and the Adirondacks as *the solution*. Rather, he suggests, these places show us the direction in which we ought to move if we wish to reverse ecological, economic, cultural and political degradation.

The final section of **Hope** focuses on the potential for recovery in the Northern Forest region. Readers of the **Forum** will find many of the characters and issues in this section quite familiar. McKibben, unlike most apologists for the status quo and conventional wisdom, treats Northern Forest visionaries with respect. We do not have to liquidate our forests for the sake of a "healthy" economy. We can protect large chunks of forest land as wilderness, as has already been done in the Adirondacks, and as has been proposed by folks like Michael Kellett of RESTORE: The North Woods. Local agriculture can meet many of the needs of local communities. We can live more lightly on the land—and have more fun doing so.

When I think of Bill McKibben's work from **The End of Nature** to **Hope, Human and Wild**, I am reminded of a long-deceased friend, a scholar of the works of Voltaire, who said: "I am an optimist without hope." As industrial civilization continues to unravel the integrity of both natural and human communities, there is ample reason for despair. But, for those of us who wish to go on living, there is a need to find reasons for hope. Bill McKibben shows us that there are legitimate reasons for hope in nature and in community. Our challenge is to roll up our sleeves and develop more working models that may inspire others to change the rules of the game so that one day *Homo Sapiens* may live in a way that meets basic needs of life, liberty and the pursuit of happiness, while not denying to others—human and non-human—the same rights.

Downeast RC&D Proposes An Equitable New Log Scale Rule

by William Butler

The need for improving the log scale rules has emerged in discussions of sustainability of the forest resource. This inquiry is pertinent in establishing benchmarks for comparison, one of the ways of quantifying the volume of wood that we take from the resource. Sustainability implies that removals from a resource not exceed additions.

A log scale rule, of course, is a tabulation of the amount of lumber that can be sawed from logs through a range of diameters and lengths. The lumber output is expressed in 'board feet', a unit board one inch thick and one square foot in area on the broad surface. This unit is of high moisture content and is not yet in the commercial form you might buy at the lumber retailer. It has to be dried and smoothed to uniform, standard dimensions.

Apart from estimates of standing volume of lumber in sawtimber, a scale rule is needed to determine payments to landowners for log stumpage and to loggers for their part in supplying sawmills. In some jurisdictions, a log scale rule is used in determining the timberland tax. We can say that the fairness of these transactions, and the community's economic sustainability is affected by the nature of the rule employed. Selling sawlogs by weight does not avoid first scaling with a rule samples of logs so as to fix a weight conversion factor.

Sawing round logs into rectilinear lumber requires some 'wastage' in removing the curved outer surface to obtain a flat face, and in the amount of wood removed as sawdust as the saw cuts. Most logs rules ignore the wood produced as slabs, edgings, and sawdust, once assumed to be of little value.

How many log scale rules would you think were needed? The lumber size is defined by the unit board foot; the geometry of taking off the slab can be calculated or measured empirically at a sawmill. The width of cut, the 'kerf', is a function of the saw thickness and how well or poorly it is maintained; there can be agreement on a typical kerf. This process narrows the values realized to a single output for a log of given diameter and length. So, do we have one scale rule?

Not really. According the US Forest Products Lab, in the United States and Canada there are over 95 recognized rules bearing about 185 names.

To say that not many of these rules are honest is a statement easily defended. The numbers in many seem to have been contrived to benefit the sawmill owner. One of the issues in the 1975 strike of the Maine Woodsmen's Association was rampant cheating on scale at the mills. One expected to be cheated at the paper mill, and was. The Legislature followed with a Wood Measurement law, devised by the Weights & Measures division of the state Department of Agriculture. We got a good law. For logs the International 1/4-inch Rule is the standard measure, with use of three others optional, by agreement; these rules are the Bangor, the Maine, and the International 1/8-inch. All give predicted lumber yields greater than the International 1/4-inch. Foresters and wood buyers like the Int. 1/4-inch; those selling timber or their services prefer the Bangor or Maine rules. For the usual run of logs, the difference, usually 5 board feet per log, may be ten per cent of the log scale.

Why this difference in two supposedly rational tables? Do logs sawn in a well-kept mill yield according to the one or to the other? The answer is that they may saw out more lumber than predicted by either. Certainly, straight sound logs yield more than says the International 1/4-inch. Why? Well, Judson Clark made this rule in 1900 using assumptions which include an average "crook" of 1.5 inches in a 12-foot log length. He thereby discounts every log scaled, crooked or not. (This information is in the official USDA reference, *A Collection of Log Rules.*) This is a nice cushion for the log buyer, but knowledgeable rural people sell on the Bangor rule.

If the tree grower and logger have the option of agreeing with the log buyer on the Bangor rule, isn't that all we can hope for? The bigger problem is that, like the rest, the Bangor rule is derived with the mill technology that was current a century ago, producing lumber to size standards that have since been severely reduced. You may notice that boards or 2x4 studs are not what they used to be; they are thinner and narrower than when I learned to frame a house. For twenty years or more sawmills have produced this reduced-size lumber with thinner saws and less allowance for process variation. The undersize lumber is still sold as having the "nominal" board foot content of the previous standard. Translation: you can make lumber out of logs much smaller than previously possible, and you now get more nominal-size lumber from all logs.

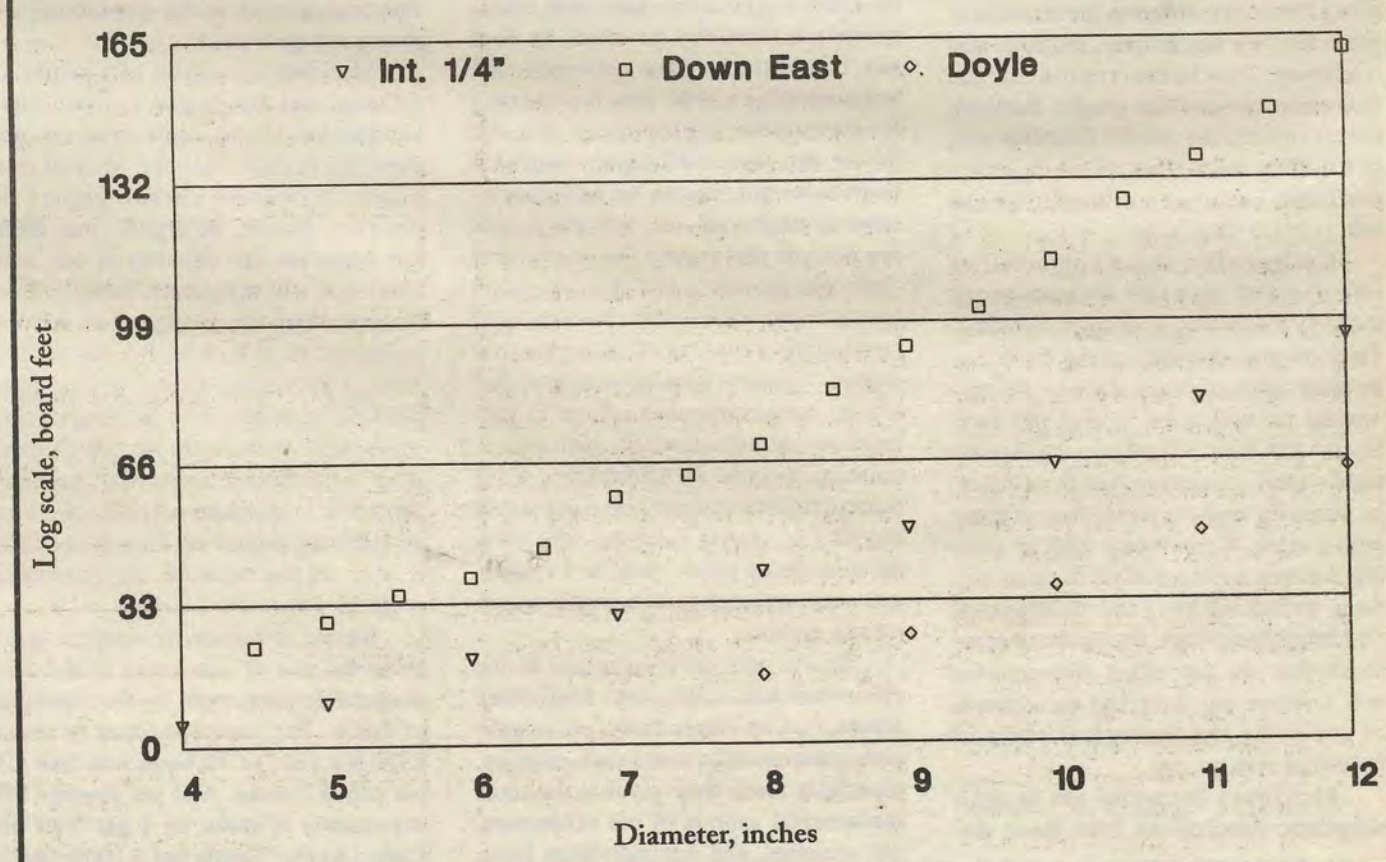
It should be seen that under any of the current log rules, the increased yield described above accrues only to the sawmill. Further, no consideration of the volume of residues, increasingly valuable for paper-making, is returned to the landowner or logger. (Former Sen. George Mitchell of Maine shepherded a bill which declared sawdust to be 'post-consumer' waste, so the Lincoln, ME papermill could qualify as a recycler.)

Table 1: Down East RC&D Log Rule

log dia. inch	log length, feet 8	10	12	14	16	18	20
4.5	10	12	16	19	23	28	33
5	13	16	20	24	29	34	39
5.5	15	20	26	30	35	40	46
6	18	23	28	34	39	46	52
6.5	21	27	33	39	45	54	65
7	25	32	40	47	58	66	74
7.5	28	37	46	55	63	72	82
8	33	42	51	60	70	83	96
8.5	37	47	58	69	83	96	109
9	42	54	67	80	93	106	121
9.5	48	61	74	87	102	117	132
10	53	67	82	96	113	130	150
10.5	59	74	91	108	127	145	163
11	64	81	99	119	137	156	175
11.5	71	89	107	128	148	170	191
12	76	96	116	139	162	186	209
12.5	83	105	128	152	176	202	228
13	91	115	140	165	171	218	246
13.5	98	124	150	179	206	233	265
14	105	134	162	191	221	252	285
14.5	113	142	174	205	239	271	305
15	122	154	188	221	255	290	325
15.5	130	164	199	234	271	307	347
16	139	175	210	249	288	331	372
16.5	147	186	226	267	311	353	397
17	159	199	241	283	326	371	416
17.5	166	210	253	298	343	394	443
18	176	222	268	317	369	420	469
18.5	186	236	288	340	389	441	496
19	197	249	300	353	407	460	517
19.5	207	260	314	370	428	487	547
20	217	274	333	392	451	513	576
20.5	229	289	351	414	477	542	606
21	241	305	369	433	498	565	635
21.5	255	320	385	452	523	593	665
22	264	332	402	474	548	621	695
22.5	277	349	424	497	572	648	726
23	291	365	440	519	595	675	760
23.5	304	381	459	542	626	712	795
24	315	399	481	566	650	738	827

Fig. 1: Lumber Recovery Predicted by Several Log Scale Rules

16-foot logs



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Log Scale

Enter Serendipity. In the 1970's the US Forest Service devised a computer program to control a sawmill to improve lumber yields. Using the computer for what it does best, rapid calculation, the program examines log size to determine the best approach in sawing—essentially, where to place the first cut. This exercise of geometry gives the settings for the sawmill machinery, which often is automated, using this program as its mind. The program may be asked to maximize lumber production from each log, or to produce a particular size piece that gives greatest dollar return. The original program or a variant runs most of the sawmills in North America, mills where most lumber is produced.

The program, which is freely available, runs well on a PC. Given a range of log diameters and lengths, it produces the machinery settings, and, incidentally, a table of the lumber yield from each log. People at the Down East Resource Conservation & Development Council adopted the proposal that the outputs be incorporated in a new log scale rule. For the numbers, Jim Philp, a USFS wood technology specialist with the Extension Service at Orono, ran the program on his 486 PC. The program option chosen was to maximize lumber yield from a range of logs typical of current spruce and fir sawlogs, diameters yielding at least one 2x4 stud, lengths from 8 to 20 feet. The result is shown in the accompanying table (*"Down East RC&D Log Rule"*).

Compared with any other rule, the Down East rule shows significantly higher lumber contents, particularly when small-diameter logs are sawn. Also significantly, it reports log scale by 1/2-inch steps, contrasting with the older practice of ignoring fractions of inches. The numbers for 16-foot lengths are compared with two other rules in figure 1. (Note: the Doyle Rule is especially used in the Southeast US, and is considered to be notoriously bad by contrast even to the Bangor.)

Implicit in the information from which this rule is derived (the Best Opening Face algorithm) is an accurate estimate of the volume of the log not turned out as lumber. This quantity is the volume of the residues, which do have commercial value, and which should enter into the calculation of log price. Owners of large tracts of timberland are aware of this component of value, even including those exporting logs to Canadian sawmills. If your state has current-use valuation of timberland, the volume and value of the so-called residues should be a factor in land valuation, just as is lumber price. My study of Maine's so-called Tree-Growth tax scheme shows that for spruce-fir land especially, but even for pine growth, the Maine Forest Service and Bureau of Taxation grossly under-estimate wood value and, consequently the taxable value of timberland. The effect is to shift the tax need of the community to those not owning timberland. Who needs this?

To sum up: The Downeast RC&D Log Rule is a log scale rule applicable to species commonly sawed into 'dimension' or light-framing lumber. The lumber manufacturers accept a wide range of softwoods under this standard. The mill setup for this rule was not the highest technology, but a reasonably achievable level; current dimension lumber mills in Maine and Quebec will recover in excess of what the Down East rule gives. Also, portable band mills, such as the Wood Mizer, are more efficient than the rule presumes. The volume of the residues is typically 40% of the original log volume. It may also be seen that the rule-of-thumb about the cord equivalent of a thousand board feet is a gross overstatement.

William Butler has been immersed in the rural, paper industry forest economy since 1948.

Forest Service Survey

Continued from page 6

the 2-4 inch diameter classes. They do well after heavy cutting, unlike red spruce and hemlock. Indeed, these trends mean that the Acadian Forest, which in presettlement times was dominated by red spruce, sugar maple, beech, and yellow birch, will increasingly be dominated by the shorter-lived, lower-quality species coming up in younger diameter classes.

Productivity

Industrial forestry is supposed to make forests more "productive." In Washington County, which has two large resident industrial landowners (Georgia-Pacific and Champion International) net growth per acre per year declined from 30.7 cubic feet in 1971 to 19.4 cubic feet in 1995. The US Forest Service definition of "timberland" includes the provision that the land produce (or be capable of producing) "crops of industrial wood (more than 20 cubic feet per acre per year)." This must mean (since the figure is an average rate of growth) that more than half the timberlands in Washington County are not meeting the minimum requirement of growth to be considered a timberland.

Conclusion

So there you have it; we have sustainable declines, overutilized underutilized species, increased regeneration of shorter-lived, poorer-quality species, and declining productivity of timberlands that are hardly timberlands. I am sure government and industrial spin doctors are, even now, busily at work finding cheerful tidings from this survey. It will take a lot of creativity, but enough money can buy such creativity. I can't wait to see.

Maybe the good news is that development was not, as the Northern Forest Lands Council feared, the major source of land conversion. It was, instead, logging road rights-of-way. Or, perhaps, skeptics can attack the Forest Service figures as being unbelievable. If this is the case, it leaves us with no commonly accepted data from which to discuss forestry trends. For those who insist that we can not change the status quo unless we have proof that there is a problem, this may be the ticket for another ten years of minimal restraint.

Windpower

Continued from page 17

themselves may be grounds for the Court to overturn the agency decision. At this writing, no hearing date has been set for the Court to hear arguments on the motion.

Utility Line Permit Appeal

In another action, Friends of the Boundary Mountains, a grassroots group opposing the project, is appealing the Utility Line Permit (ULP) for the 23.1 mile long transmission line to the wind power project. The ULP was issued approximately a week after the rezoning approval in August. This appeal is being conducted within the agency under an interagency appeals procedure. Since the ULP was granted by a single LURC Staff person without a hearing, the first step in the appeal process is to request the Commission to examine the Staff decision and make a decision itself.

The primary grounds for the ULP appeal is that the company has significant financial problems and cannot demonstrate it has financial capability to carry out the project. Secondly, Kenetech's option for obtaining an easement for a segment of the transmission line on International Paper Company land appears to have expired without being exercised or renewed. If this is so, it means Kenetech does not hold right, title or interest to the land it intends to use for the transmission line. A third problem with the ULP is that it is not contingent on final approval of the rest of the project. And finally, the transmission line for the wind project needs to tie into Central Maine Power's system through a line that goes to the Stratton biomass plant. That transmission line had not received a certificate of compliance at the time Kenetech's ULP was issued. For Kenetech to tie into a line that is itself out of compliance with permit conditions would be a violation of the law.

The Commission is expected to take up the ULP appeal at their regular monthly meeting in February.

Pamela Prodan is the Maine attorney representing the groups and individuals appealing the LURC decisions.

Support

The Northern Appalachian Restoration Project

A Network of Grassroots Activists in Northern Forest Communities Working to Assure Sustainable Natural & Human Communities

Northern Appalachian Restoration Project Activities Include:

• Publication of *The Northern Forest Forum*
(Six issues a year of the nationally acclaimed journal featuring the work of many of the most talented activists, writers, artists, photographers, and poets of the Northern Forest Region)

• The Forestry Reform Project
(Includes the Low Impact Forestry initiative in Maine, as well as grassroots forestry initiatives in NH & VT)

• The Herbicide Project of NH & VT
(Citizens of the Connecticut River Headwaters working to ban herbicides as a tool for forest management in our communities and states)

• Wildlands Protection
(NARP is promoting a proposed 8-million acre HEADWATERS Regional Wilderness Reserve System in northern Maine, NH & VT and is working with The Wildlands Project and other groups to develop strategies for protecting the biological integrity of the Northern Appalachian & Laurentian regions of North America.)

• Renewable Energy Assistance Program
(Promoting a decentralized sustainable energy policy for the Northern Forest Region that does not conflict with wildlands protection)

• Coastal Waters Project
(A Citizen's Network dedicated to protecting and restoring the Gulf of Maine's coastal ecosystems & economies)

• Support for Northern Forest Community Grassroots Organizers & Activists

NARP Needs Your Financial Support

- *NARP Activists accomplish much with very little money. In the past year they have:*
  - Played a critical role in developing the strong public support for the Conte NWR on the Connecticut River in crucial and controversial Northern Forest region hearings
  - Halted aerial herbicide spraying by paper companies in Vermont in 1995 and 1996
  - Forced the Vermont Forest Resources Advisory Committee to reconsider its unwillingness to assess clearcuts and liquidation logging
  - Helped fight the ill-conceived Wind Power Proposal for the Boundary Mountains that now appears to be collapsing
- *Citizen Activists Rely on NARP for information, inspiration, & assistance*
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YES! I want to support citizen activists working with NARP to assure sustainable natural & human communities in the Northern Forest Region.

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___ Enclosed is a contribution to the Northern Appalachian Restoration Project for _____ to support this important work.

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