Needed - An Ecologically Sustainable, Socially Responsible Regional Energy Policy

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Politics of Anger Won’t Solve the Ecological Crisis

"No one ever went broke underestimating the intelligence of the American voter."
—H. L. Mencken

Do the recent stunning election results mean the U.S. has gone Republican? Anti-environmental? Resolving the most dangerous and pressing problems of the age? The answer to all these questions is no! Most voters voted against the incumbent, not for the Republicans. They voted their anger, not for a unifying and ennobling vision.

Although some friends of the environment lost, and too many anti-environmentalists won, voters in conservative Arizona defeated a "takings" bill advanced by the property rights/wise use extremists.

While the public voted against tax and spend centralized government, the recipients of their votes—the Republicans—are hardly likely to dismantle the elements of the federal government most responsible for voter anger and despair—policies such as GATT and tax laws that subsidize transnational corporations and destroy local self-sufficiency.

And, despite all the hoopla, despite all the promises to restore state-sponsored school prayers, to cut the taxes of the wealthy and gut regulations designed to protect the environment, the Republicans will not address the most fundamental, the most intractable environmental problems of our age—problems that won’t go away simply because they aren’t on Nestlè Giggles’s radar screen.

Two paradoxes of the election illustrate the myriad messages sent by the voters: the alleged economic "recovery" did not help President Clinton and the Democrats, and the clamor for "local control" resulted in a landslide victory for the party that has mastered the art of local control rhetoric whilst advancing the agenda of the transnational corporations.

I suspect that the reason voters did not show the Democrats more gratitude over the supposed economic recovery of the past year or two is because they haven’t felt it in their personal lives. It has been a "productivity" recovery, not a "jobs" recovery. The corporations have regained profitability by "downsizing" their work force, not by creating new jobs or bolstering job security. If you don’t believe me, ask the residents of any Northern Forest mill town. Conclusion: the centralized, pro-transnational corporation policies of both Democrats and Republicans are not benefiting the average voter.

The Republicans played skillfully on voters’ growing desire for greater control over their affairs on a local level. Republican rhetoric against big government, for states rights and local control sounded good, but don’t expect any more progress on the local control issue than President Reagan made balancing the budget. If the Republicans were sincere about getting rid of big, centralized government, they would reverse government policies that favor the transnationals and hurt local and regional initiatives. Instead, they have suggested abolishing the Small Business Administration, and they favor passage of GATT which will make it even easier for the transnationals to evade responsible environmental and labor practices.

If you are looking for an analogy to today’s political, social and moral crises, try the 1850s. For decades Congress evaded dealing with the issue of slavery through clever, but disastrous compromises—the Missouri Compromise of 1820 and the Compromise of 1850. Still, the issue wouldn’t go away. The 1857 Dred Scott decision by the Supreme Court put the nation’s legal system officially on the side of slavery. Politically, the Know-Nothing Party anticipated the legions of Perot and Limbaugh. Property rights—slavery—was a central issue in the rupture between North and South.

Throughout the 1850s, the Democratic Party—the party of slavery—was able to hold on to power until it collapsed with the onset of the Civil War. The opposition party of the preceding decades—the Whigs—disintegrated after the 1852 election, as bereft of ideas and vision as today’s Whigs. Out of the ashes of the Whig Party grew the party of Lincoln, the party that eventually ended slavery.

What is most characteristic of the decades prior to the Civil War is the inability—or unwillingness—to face up to the central issues of the day.

In the mid-1990s the Democratic Party has lost its way. Mainstream environmental groups have grown moribund advocating a strategy of compromise and inside-the-beltway political maneuvering, are in nearly as much trouble as the Democrats are. The Republicans have mistaken their victory as a mandate for their right-wing social agenda. Soon enough, they’ll learn that they are the quicksand—a poor foundation upon which to build.

Meanwhile, the environmental crisis will grow worse. Our species has overshot the limits of this finite planet to provide for our habits of economic growth fueled by consumption and waste. As natural ecosystems unravel, conflicts over ever scarcer "resources" will grow ever more dangerous.

We have already run out of places to store the wastes we produce. Global warming, the hole in the ozone, mercury and dioxins in Maine’s fish are clear warnings that we can no longer evade the environmental consequences of our actions. The “Contract on America” ignores this real crisis.

The Forum will continue to promote sustainable natural and human communities. We share voter anger at the failure of centralized government. We understand that economic recovery that doesn’t help the average citizen and doesn’t alleviate environmental stress is a sham. We reject Republican proposals for lowering taxes for the wealthy—capital gains, for instance, and for promoting policies that subsidize centralized corporations while undercutting the interests of local, small-scale entrepreneurs.

When the regulations-bashers and welfare-baiters acknowledge the harm to natural and human communities caused by the transnationals who underwrite their election campaigns, then we’ll have a genuine revolution on our hands. For now, whether a Democratic or Republican Congress, the corporations win and the rest of us lose.

So the anger will grow more unfocused, more destructive.

Meanwhile, the Forum will continue to work with those who are trying to offer a strategy that is ecologically realistic, economically sustainable, politically equitable, and morally generous. While the demagogues corner the market on despair, we’ll continue to offer a realistic and hope-filled alternative vision.

—Jamie Sayen

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Reader Objects to Clearcut Caption

Dear Editor,

I would like to address some of the inaccuracies on the caption of the West Middlesex-Big W aerial photo from your Mid-Summer 1994 issue (page 7).

You imply that the entire area was planted with "genetically alien stock." Actually, less than 10% of the area harvested was ever planted, as the natural regeneration did very well. Most of the operations in Big W occurred five to ten years earlier than those in the southern portion of West Middlesex, so most of these natural stands are now 20 feet or more tall. Those of us who have seen this area from the ground can verify that the forest was not liquidated as you contend.

Before becoming involved with research here in the Amazon region, I worked extensively on both of these townships as a forester for Scott Paper Co. One of my first assignments was a timber cruise of the southern half of West Middlesex. At that time, the summer of 1977, the area was covered by mature softwood stands with balsam fir as the dominant component. Spruce budworm feeding had been severe, with patches of spruce and fir already dead and widespread mortality inevitable. Having seen that entire area on foot, I can tell you that had the trees not been harvested, there would have been a situation similar to the Baxter Park Blowdown, which in 1978 became the site of the Baxter Park Fire.

Thank you,
Mark Armstrong
Manaus, Brazil

Editor Responds: I regret if the caption implied that Scott replanted the entire two township clearcut. But, I'll stick by my belief that nothing justifies this kind of forestry. Plantations of genetically alien stock of any size are ecological nightmares. Those interested in a thorough history of the spruce budworm spraying program in Maine in the 1970s and 1980s should consult Beyond the Beauty Strip: Saving What's Left of Our Forests by Mitch Linsky, Tilbury House, Gardiner, Maine, 1992, pages 204-241, 264-270 and 322-333.

Toxic Vacationland
Warning: Maine Can Be Hazardous to Your Health

Those of us who love Maine prefer to think of the Maine Woods, the wild rivers, the coast, the birds and wildlife. But, the truth about Maine is far less romantic. Inexplicable governmental inaction on pollution and environmental protection has produced a toxic calamity for fishermen, birdwatchers and lovers of the wild. Since 1986, the state has been forced to issue at least six poorly publicized health advisories regarding poisoned wildlife. When are Mainers going to force their government to end its criminal collusion with our toxic culture? When are tourism brochures about Maine going to tell the truth about Toxic Vacationland?

1986: Maine's Department of Inland Fisheries & Wildlife advised hunters not to eat organ meat (liver or heart) of moose or deer over one year of age because they contain dangerous levels of the heavy metal cadmium.

1988: Maine issued an advisory for dioxin in fish from lower stems of three major rivers: the Androscoggin, Kennebec, and Penobscot. Dioxin is a by-product of chlorine paper bleaching, and the advisory is still in effect.

1991: High levels of mercury were found in the remote Allagash Lake.

1991: A study showed high levels of mercury in eagles. Bald eagle reproduction is lower in Maine than any other bald eagle population in the United States due to high levels of dioxin, mercury, DDT and PCBs. DDT was banned in 1972, yet it persists. This study found at least some of the highest levels of PCBs recorded in the world.

1993: A mercury study found 20,000 parts per trillion in loons. A Maine Department of Inland Fisheries "health advisory" warned prenatal women, nursing mothers, women who may become pregnant, and children under age eight not to eat any fish caught in lakes and ponds in Maine. All others were warned not to eat more than 6-22 meals a year.

1994: Dangerous levels of Dicnix were found in Maine Lobsters. Especially dangerous is the tomalley of lobsters, considered a delicacy.

NH Governor Wants to End Funding of State's Natural Heritage Program

The New Hampshire Natural Heritage Program (NHNHP) is in deep trouble. The Commissioner of DRED (Department of Resources & Economic Development), William Bartlett, has deleted from next year's state budget the paltry $70,000 the NHNHP receives annually.

Bartlett admitted to Eric Aldrich of the Keene Sentinel (October 18, 1994) that he has little understanding of what the program does, "Is this something the State of New Hampshire needs?" he asked.

The Heritage Program monitors the state's 266 endangered or threatened species, reviews state wetland permits, planned highway projects, and some planned timber harvests to help avoid conflicts between economic growth and natural resource protection. And it is the equivalent of the canary in the mine shaft—it can sound an early warning when species and communities are in trouble.

The invaluable Natural Heritage Program is even more important in light of Recommendation 21 of the Northern Forest Lands Council that states should conserve and enhance biological diversity across the landscape. Critics of the Council's obsession with "state rights" on issues such as protection of biodiversity, point to Bartlett's move as proof that the state of New Hampshire lacks the resources, understanding or vision to do the job adequately.

The NH Legislature's committee that reviewed the NPLC recommendations understood the importance of the Natural Heritage Program and has strongly recommended to the full Legislature that full funding be restored. Responsible leaders of the state's timber industry, especially Charles Niebling, Executive Director of New Hampshire Timberland Owners Association, have defended the Heritage Program, demonstrating that the fate of the biotic integrity of the state and region transcends partisan lines. Here are two proposals:

1) Triple the NH Natural Heritage Program's budget to $200,000 so that it can begin to address the issues raised by the NPLC and the public regarding the establishment of ecological reserves.

2) Remove natural resources agencies from the jurisdiction of DRED. No commissioner—even one who does understand biodiversity issues—can provide over state policy for both economic development and the protection of biotic integrity. The conflict is fundamental, and inevitably, short-term economic interests win out over long-term protection of our life-support system.

-Jamie Sayen

Winter Solstice 1994

The Northern Forest Forum
The Maine Woods is the largest tract of wildlands in the eastern United States. However, today this region is under siege. Maine Woods Watch is devoted to documenting the good, the bad, and the ugly in the Maine Woods today, with an emphasis on opportunities for citizen action to protect and restore the essence of the region, its wildness.

*Election Results. Elections for major offices this fall have provided reason for both optimism and concern. Victors in key races include Angus King (Governor), Olympia Snowe (US Senate), Jim Longley (US Congress—southern Maine) and John Baldacci (US Congress—northern Maine). King has a mixed environmental record. He lobbied for the state’s returnable bottle bill and supported legislation to help establish the Land for Maine’s Future program. But he wants to put the car emissions testing program and build the marine terminal in Portland. The Maine LCV, has hired a couple of aides familiar with environmental issues, but limited leadership on conservation issues. Baldacci, who has a mixed environmental reputation, has also hired a part-timer who will continue to work full-time for the Maine Forest Products Council recently that clearing is a “legitimate forestry tool” that should not be banned. Snowe, who earned a 62% score from the national League of Conservation Voters (LCV), has shown limited interest in Bioenergy initiatives for northern Maine. Baldacci, who earned a zero from the Maine LCV, has hired a couple of aids familiar with environmental issues, but he has also hired a part-timer who will continue to work full-time for Champion International Paper Company. Longley, who has done consulting work recently for the Paper Industry Information Office, the lobbying arm of the industry in Maine, has paid little attention to environmental issues to date, but with public support he may cultivate an interest.

*Greenwash? The Maine Forest Products Council has hired a new staffer with extensive TV, radio and newspaper experience. One of its top priorities is to organize a rehabilitation program on the workings of the Windpower program. The new guy, Windpower’s argument for a gargantuan 639-square kilometer wind farm in the Boundary Mountains is running into gusty weather with the Land Use Regulation Commission which is expected to decide on the application this winter.

*INESCANT. The Maine Forest Products Council has hired a new staffer with extensive TV, radio and newspaper experience. One of its top priorities is to organize a rehabilitation program on the workings of the Windpower program. The new guy, Windpower’s argument for a gargantuan 639-square kilometer wind farm in the Boundary Mountains is running into gusty weather with the Land Use Regulation Commission which is expected to decide on the application this winter.

*Speaking of Bowater and Nova Scotia, the company has been in hot water over questionable financial activities. *Vis. Fair Inc. of Massachusetts recently bought the 122-year-old Banton company, a Newport wood products manufacturer, one day before the plant was to close its doors. *Don’t, a Canadian company with interests in Maine, has sold its newspaper and groundwood papers division and fired its chairman and its CEO. *While painful in the near term, a downsized forest products industry is not always bad news in the long run. In Oregon, where protection of old-growth forests was predicted by the industry to forestall inevitable ruin, economic catastrophe has been averted according to the New York Times. "Burlingdale’s early employment and wages have risen.

*Dirty Business. According to the latest EPA data for 11 of the top 13 largest pulp and paper mills in Maine, the largest is the International Paper plant in Jay and Georgia-Pacific’s mill in South Portland. Five more are planned under the federal Wood Transportation Program. Red maple and hemlock, considered underutilized species, are being used to demonstrate local utility. *Residents in Millinocket and East Millinocket, feeling rather powerless, voted to sente tax abatement disputes out-of-court with Great Northern.

*Industry in Transition. Bowater Inc. and its subsidiary Great Northern Paper have a new CEO who hopes to financially turn around Maine’s largest forest landowner. Arnold Nemirov, new Bowater President, spent 16 years at Great Northern Nekoosa before leading Champion International Paper to record profits from 1990 to 1994. Donald McNeil, new GNP President, has been with Bowater for 17 years and comes to Maine from the company’s Nova Scotia operation. *Speaking of Bowater and Nova Scotia, the company just closed $10 million sale of its sawmill in the sale of “non-strategic” forestlands there. *James River Corp. grew exponentially in the 1970s and 80s through acquisitions in 25 years, including a large mill in Old Town. *Champion International Paper is embarking on the largest downsizing in its history. The company has already downsized to cut debt, including possible sale of its mill in Berlin, New Hampshire. *The Conservation Fund is seeking a good home for some conservation easements in the Northern Forest Alliance have begun to put a little more definition to a broad proposal released last spring calling for ten large conservation areas in the Northern Forest region, including five in Maine. *RESTORE: The North Woods does not have only plenty of deforestation, but also plenty of development. The National Park, it has also distributed 20,000 brochures about the park. *The Conservation Fund is seeking a good home for some conservation easements five years ago in eastern Maine. *Dick Spencer and Ed Kifoury have received the Calder Conservation Award for protecting 10,000 acres in the Rangeley area.

*Trees to Go. Since the state’s Forest Practices Act was passed in 1985, over two million acres have been logged (including hundreds of square miles legally clearcut) and more than 1.5 million acres are scheduled for cuts during the next two years. *Much of this wood fiber goes offshore. This is the first year that rolled paper has been shipped regularly from Eastport. *Little shipment, twenty-five hundred tons from Georgia-Pacific, went out in November headed for Korea. *A bit of the wood stays here. Guy Gannett Newspapers have agreed to buy all of the paper for its four newspapers in Maine from Great Northern Paper. *Five timber bridges have been built in Maine since 1991; five more are planned under the federal Wood Transportation Program. Red maple and hemlock, considered underutilized species, are being used to demonstrate local utility. *Residents in Millinocket and East Millinocket, feeling rather powerless, voted to send tax abatement disputes out-of-court with Great Northern.

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Toward a Northern Forest Regional Energy Policy

by Jamie Sayen

The controversy over the proposed development of the Boundary Mountains in western Maine (see Forum, vol 2 #6, page 14) for 639 windmills, 38 miles of new roads, 56 miles of upgraded roads, and over 20 miles of transmission lines in an area identified by 20 members of the Northern Forest Alliance as a Conservation Priority Area (I prefer “wildlands” area), has brought energy planners into direct conflict with wildland protectors.

We need to develop a regional energy policy that compliments, not conflicts, with efforts to protect wildlands through the establishment of ecological reserves.

Current Energy Supply is Fragile:

1) Due to projections of the shutdown of several nuclear plants in the next 20-30 years, the uncertainty of renewing Hydro-Quebec contracts after they expire early in the next century, and the need to address greenhouse gas emissions from fossil fuels, the energy situation in the region is indeed precari­ous. Nuclear and oil power account for 62% of the region’s energy use. Replacing them will be a huge task; if we accept the assumption that the region will continue to consume approximately 26,000 MW.

2) There is a major push to promote natural gas as “clean” energy. But it isn’t.

3) Conservation & Efficiency efforts are losing ground. There are pressures to roll back C & E efforts. Instead, as industry and politicians continue to orchestrate an anti-regulatory atmosphere, utility companies are promoting electricity use and engaging in retail-wheeling. We must promote avoidance from frivolous energy uses, and tie gains from conservation, efficiency and avoidance to a reduction of overall energy use, not as a way to permit further growth under current capacity.

“Renewables”:

1) So-called “Renewables” may be able to replace nuclear and fossil fuel sources, but: (a) current capacity is low; (b) environmental impacts of renewables are often glossed over by their proponents who focus attention only on the fact that they do not produce CO2; and (c) they must truly replace a nuclear plant or oil use (i.e., opening a new wind project must be tied to the closure of a nuclear or oil facility), otherwise, the renewables become additive to, not replacement of undesirable sources.

2) What is the maximum potential capacity for renewables such as biomass, hydro, wind and solar if:
(a) there are few environmental restrictions on the development of these sources?
(b) there are strict environmental restrictions and large ecological reserves are established in the ten wildlands areas identified by the Northern Forest Alliance groups?

*CLF estimates that (if we unmitigated accept current levels of growth and current end uses of electricity) we will need about 13,000 MW from these sources in order to replace nuclear and oil sources.

*But, most hydro potential has already been developed, and there is growing opposition to existing dams.

*How much biomass will be available, especially if the Sears Island Port is built so we can export wood chips?

*What are potential windmill sites that do not conflict with wildlands strategies and that do not adversely impact bird populations?

*Why are we not more aggressively promoting small-scale solar?

Basic Issues for a Regional Energy Policy:

1) We need a comprehensive regional energy policy before we accept any new proposed projects. Otherwise, we simply preside over the piecemeal sacrifice of the Northern Forest. This policy must be developed through a public debate that demystifies, not obscures, energy policy issues.

2) Will control of energy be centralized as it is currently, or will we move toward a decentralized, communi­ty-based energy policy? How do we promote a successful decentralized policy?

3) Should the Northern Forest promote itself as an energy colony?

5) Have we exhausted conservation, efficiency and energy avoidance measures? There should be no new projects until we have.

6) What is the need for a proposed project? Does the region really need the electricity? Is the electricity for frivolous or necessary end uses? Have we exhausted all conservation measures?

7) Will the energy generated be used locally or will we sell it to another region?

8) Is the proposed new project directly tied to the decommissioning of existing nuclear or oil facilities? How do we reduce pollution energy sources if our “renewables” are additive, rather than replacement?

9) Land Use Issues: What are the land use issues associated with proposed projects. Hydro, wind and biomass projects impact a far greater amount of land than just the site for the project. We must examine all projects from a landscape ecology perspective and assess cumulative impacts of existing and proposed projects.

10) Externalities: Traditionally, society lets polluters and developers pass externalities on to society. Recently, Massachusetts and Vermont have required that externalities be evaluated.

11) Is the proposed new project consistent with wildlands strategies and policies governing energy policy. "Call of the Wild.

Pamela Prodan of CLF outlines the social policy issues we must address. He argues for a decentralized, democratic strategy that allows people to regain responsibility for their lives.

Next, the energy staff of the Conservation Law Foundation (CLF) provides a brief “energy primer” for New England, including a look at the environmental costs of the current energy policy and the potential of “renewable” energy. CLF also analyses dangers and opportunities posed the current movement to deregulate energy.

Finally, Pamela Prodan examines existing obstacles to a sustainable energy policy that are built into current laws and policies governing energy policy.

Value-added forest product manufacturing. Beats chipping and/or shipping them. *The US Forest Service has reversed an earlier decision and doubled its subsidized windmills on the White Mountain National Forest for next year to 18 million board feet. The forest industry wanted a cut closer to the 29 million board feet slated for removal this year.

*Wasting Away. Recycling of wastepaper is booming, up to 30% last year in Maine. A large number of mills in Maine have significant recycling programs. In fact, Great Northern reports a serious shortage of wastepaper for its huge recycled paper plant. Prices for old newspapers have quadrupled to $100/ton. *Stone & Webster Development Corp. has chosen Auburn for the site of a planned $65 million Virgina Pulp Substrate plant. *Millinocket is not wasting time trying to diversify beyond paper. The town has a committee working to attract value added primary or secondary forest products manufacturing plant. *Landowners in the Maine Woods increasingly report problems with wastes being illegally dumped. Some are considering limiting access to control the problem. *James River Corp. has introduced a new toilet paper that is supposed to be the first brand not to disintegrate when wet. More persistent waste?

*Call of the Wild. State wildlife biologists will search for wolf tracks and calls this winter in the Maine Woods. *In northern Minnesota where their populations are steadily recovering wolves have been bolstering local tourism. A lesson for Maine? *At least one Peregrine species, the peregrine falcon, has been recovering well in Maine over the past decade. Five pairs raised ten young in 1993. This year half a dozen young pere­grines were released at Borestone Mountain. By the way, the first child born of English parents in New England was named Peregrine White, born in 1620. Happy holidays.

*Questions? Contact:

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*Notes:

- 1993. This year half a dozen more peregrines were released at Borestone Mountain. By the way, the first child born of English parents in New England was named Peregrine White, born in 1620. Happy holidays.
A Socially Appropriate Energy Policy for the Northern Forest

by Mitch Lansky

Introduction.
While timber may be the dominant industry of the Northern Forest, energy production is important as well. Energy producers (including paper companies, which are not only major consumers, but producers as well) are interested in:
- trees for biomass;
- trash for incinerators;
- rivers for hydro dams;
- west-facing ridges for windfarms;
- swaths of forest for powerline corridors (from nuclear and hydro plants in Canada); and
- forest "wasteland" for toxic and nuclear waste dumps.

National and regional energy policy can have a profound effect on the Northern Forest. Coal-powered plants and automobiles can contribute to acid rain and ozone. The price of gas can also have an effect on population mobility, which can mean more second homes, tourism, and recreation in more remote areas.

In our society, energy policy is supposedly set by the "Free Market." This implies that consumers, by choosing the least-cost energy supplies, are casting their dollar votes for the most efficient energy systems. Unfortunately for this model, not all energy producers are truly competitive. Some are state-sanc­tioned monopolies. And some energy systems get government financial "encouragement."

Even without government interference, market prices do not reflect all values. Because of this, environmental groups have lobbied for government intervention to correct what the market misses. Such intervention includes regulation of harmful activities (such as air pollution), and creation of policies favoring conservation or renewable energy sources.

Environmentalists are not the only lobbyists in town. Fossil fuels and nuclear energy are already getting major governmental favors. Economics and environment­alists there are heated debates over the merits of "renewables" such as coal. These resources require tremendous capital investments and abuses. This biomass plant in Bethlehem, NH is surrounded by a massive clearcut. Photo by Peter Riviere with assistance from the Environmental Air Force.

Ecological Impacts
Besides the obvious problems stemming from vested industrial interests lobbying for more benefits, there is genuine confusion over a full accounting of the costs and benefits of various energy options. People tend to look only at impacts of production, but full cost accounting would look at cradle to grave impacts of whole processes. Many of the ecological and social impacts are external to normal cost accounting. Indeed, putting an accurate price on ecological or social impacts is accounting would look at cradle to grave impacts of whole processes. Many of the ecological and social impacts are external to normal cost accounting. Indeed, putting an accurate price on ecological or social impacts is arbitrary. Ecological and social values are best measured by ecological and social criteria, rather than market criteria.

For full-cost accounting, we need to look at such impacts as:
- conversion of landscape;
- changes in water flow and temperature of rivers;
- creation of toxic or hazardous materials;
- pollution of air, water, soil, plants, and animals;
- energy expenditures (it takes energy to get energy); and
- depletion of non-renewable, or non-reusable, materials.

We need to look at these impacts at the following stages of production:
- mining of resources for fuel;
- mining of resources for plant components;
- transportation of resources for fuel and components;
- manufacture of components;
- refining of fuels;
- construction of plant;
- operation of plant;
- transport of energy;
- use of energy;
- dismantling of plant;
- disposal of plant components; and
- disposal of plant by-products (including radioactive or toxic wastes).

Government Costs
Energy prices do not always take into account government expenditures which can include:
- research;
- policy agencies;
- public relations;
- tax "incentives";
- "subsidies";
- "cheap" "rent" on public lands;
- insurance caps;
- identification and development of toxic or nuclear waste facilities;
- military support (to ensure stable supplies of resources from "unstable" regions of the world);
- "regulatory agencies; and"
- "infrastructure" (such as roads, sewage systems, waste disposal, police protection).

These are all the costs that the public pays, though not necessarily on their utility bills.

Distribution of Power
Production of energy entails distribution of both electrical and political power. Certain forms of production tend to concentrate political power and influence—a trend which is not conducive to a healthy democracy and can be considered a social cost. The technology and structure of power production can be more industrially appropriate than socially appropriate. (See box on this page.)

Centralized vs. Decentralized Power
The above list of criteria implies a social benefit of decentralized versus centralized power production/consumption. For example, in this region, solar, wind, and wood are diffuse power sources that can easily be used in a small scale. As a small example, a biomass plant, energy is expended cutting and shipping the wood to the plant. Two-thirds of the energy in the wood is lost as waste heat during electric production. For both centralized wind and biomass, power is lost during electric conversion and long-distance transmission. Energy is lost again as the electricity is converted back to heat.

The process is even more damaging and wasteful when one considers centralized uses of nuclear or fossil fuels such as coal. These resources require destructive mining, long-distance shipping of the fuels, extensive processing, and an elaborate corporate and government­al bureaucracy to ensure both continuous supply and public protection. Indeed, nuclear energy requires a quasi­military "nuclear priesthood" to keep wastes safely isolated for a period longer than the history of civilization.

Negawatts
The standard basis for energy policy, for a long time, has been that Trend is Denuity. Growth of energy consumption in the past means we must plan for more growth of consumption in the future. Growth in energy consumption means growth in energy production. Increased production means more and more power plants.

Based on this thinking, the major issues are where the plants are to be located and what type of fuels they will use. In other words, the debate focuses on which communities must be sacri­ficed for the sake of Progress. Those who resist are labeled NIMBYs (Not In My Back Yard).

This simplistic notion is no longer universally held. Amory Lovins, for
Photosynthesis and “Energy Cycling” in Northern Forests

by Greg Lowenberg

Photosynthesis, the process whereby plants create organic compounds from inorganic compounds in the presence of sunlight, is the essential foundation for all life. Plants (and photosynthetic algae) convert the radiant energy of the sun to chemical energy of plant compounds carbon dioxide and water to energy-rich carbohydrates and oxygen. Thus, plants are like energy factories, producing a stored form of chemical energy that possesses more energy than the starting materials. Life depends on this process. It is curious that electrical power-generating facilities are (perhaps erroneously) referred to as “plants,” because they function in just the opposite manner, converting stored energy into an usable form, soon to be dissipated as heat (although, like plants, they provide an energy form with higher utility to their consumers).

The concept of energy cycling is a misnomer. Energy does not cycle through ecosystems. The flow of energy will, for the most part, unidirectional, and the northern forest ecosystem is no exception. Photosynthesis by trees, understory plants, and photosynthetic organisms in lakes and streams of our northern forests are the first crucial step, example, has introduced the notion of “negawatts.” There is so much energy being wasted by our society that efficiency and conservation can save enough to shut down existing power plants rather than require new ones to be constructed.

Savings can be made in many ways:

* use of efficient light bulbs and motors, “use of ‘throw away’ waste” from power plants for water and space heating (co-generation);
* matching appropriate energy sources to the power plants’ needs by direct heat distribution from solar collectors to water or space heating; or
* build better-insulated houses, lighter cars, or better-designed factories that require less energy.

Where We Are Headed

Conservation and efficiency, while important, are not sufficient. To some extent, new technology has allowed us to better find and mine these resources, but it cannot create new resources. Eventually, existing deposits will become too remote and too low grade to economically extract. As society recognizes and regulates more of the cradle to grave impacts of these power sources, the economic limits will be reached sooner, rather than later.

Because of a Lingering Trend

This changing direction, therefore, is not sustainable. This generation is mining up resources, consuming products, and spewing out waste products at the expense of the next. Since the logic of unlimited growth in a world of limits is untenable, proponents of this direction have resorted to a fanatic religion of technological salvation. Future generations, they believe, will come up with technological solutions to today’s insoluble problems. Nuclear fusion, space stations, and bioengineering will give us unlimited energy and food. Scientists will also find ways to neutralize nuclear and toxic waste. Pollution will be a resource. So don’t stop now, they tell us, when the solutions are just around the corner.

Unfortunately, the high-tech “solutions” that these technological cultists are advocating are corporate solutions. The aim of the corporations that are investing in the mega-projects of the future is not to feed the hungry or clothe the poor, but to make a profit. To increase their profits, they push for technological systems that are industrially appropriate rather than socially appropriate. The distribution of wealth and power, therefore, will continue to favor the wealthy, powerful minority.

Changing Direction

Changing direction towards a more sustainable future will take more than turning off the light when you leave the room. It will also take more than building new wind farms rather than new nuclear or coal-fired power plants to supply ever-growing energy needs. It will require that we change the process that we now call “development.”

“Development” has consisted in

putting a consumer good or service between every scratch and its itch. It has been a war against subsistence. The more you separate people from responsibility over their own lives, the more the economy grows.

Third-world people who grow their own food, build their own houses, make their own clothes, and entertain themselves with story-telling, song, or dance are “under-developed”—they contribute little to their gross national product. Displace them from their land, put them to work on a plantation for a wage, and make them buy what they once provided for themselves, and (at least on paper), the economy booming. The economy also booms as their societies fall apart and money is spent on alcohol, drugs, prisons, hospitals, and other fixes.

At each stage that the manufacture and transport of the necessities of life are removed from the local community, more energy is needed. But using up energy also increases the gross national product and “benefits” the economy. As long as the GNP is our measure of economic success, we can expect to continue our “progress” toward cultural suicide.

Changing direction, therefore, means reorienting society to end the radical monopolies of cars, roads, and oil. It means incorporating many of the hidden costs that make our presently favorable energy sources artificially cheap. It means valuing ourselves from the transnational-corporate agenda for a globallyized economy.

We are so off balance towards a global industrial-growth society now, that changing direction will be painful. This pain can be lessened by a leadership that recognizes the problem and institutes a long-term transition. The pain of continuing where we are headed, ultimately, will be far worse. Energy policy is not separate from social policy.
The New England Energy System: What Happens When You Turn on a Light?

by The Conservation Law Foundation

First: Somewhere a Power Plant Fires Up

Turning on your lights may turn on a power plant anywhere in New England. The New England power grid is fully interconnected and integrated. Most New England utilities are connected to the New England electric power grid and are members of the New England Power Pool (NEPOOL). NEPOOL is an organization that allows members to "pool" and centrally dispatch their power supply resources (power plants and power supply contracts). That means that most power plants within it are in a sense "common" regional resources that are utilized without regard to the location of the demand they serve.

NEPOOL is structured this way to provide system reliability and efficiency. Incremental demand for electricity within the pool, regardless of the location of need, is met by the lowest cost available power plants. Conversely, demand reduction anywhere in the pool will reduce use of the most expensive unit operating.

Many New England power plants are owned by several utilities. For example, Maine Yankee is partly owned by several utilities in other states, while Central Maine Power owns portions of power plants in other states like the Connecticut Yankee nuclear plant. The regional power grid system allows power produced anywhere within the grid to be transmitted or "wheeled" to any buyers within or outside the New England grid. Power is also imported into the New England grid from sources like Hydro Quebec. This means that the overall mix of energy generation in the region and the price it can be produced at are far more important than what kind of demand or generation is in one's own backyard.

Then: Somewhere a Power Plant Emits Pollution

Fossil fuel plants (coal and oil) throughout the New England power grid currently emit many air pollutants which are deposited indiscriminately by prevailing winds. These pollutants include many which are harmful to human and ecosystem health, especially fragile forest lands. By displacing environmentally harmful electrical generation upwind through efficiency and renewable energy production, every state and ecosystem benefits environmentally regardless of whether or not the electricity is used locally.

Operation of the regional energy system (both within and outside of New England) results in atmospheric deposition and exposure of the forest to air pollution in gas form (for example, ozone).

Air pollutants produced by New England's electric energy system include the following: CO2, SO2, NOx, Mercury, Lead, Cadmium, Selenium, Copper, Arsenic, Zinc, Vanadium, Nickel, Beryllium, Manganese, Chromium, Small Particles (less than 2.5 microns). Once emitted, most of these pollutants travel long distances (up to 1000 KM+) before they are deposited on lands and waters. Given prevailing wind patterns, the New Hampshire forest for example, is thus predominantly impacted by energy emissions to the south and west of New Hampshire, as well as by local power plants.

Evidence of this can be found in the recent Health Advisories issued by both Maine and Massachusetts warning pregnant women, nursing mothers, women who may become pregnant and children less than 8 years of age not to eat fish from lakes and ponds in state. These advisories are based upon samplings taken from lakes and ponds to determine fish mercury levels. For example in Maine, about one-half of the fish sample had mercury levels in excess of the recommended health limits of 0.43 ppm (parts per million) and of the 150 lakes studied, about had fish with mercury levels greater than 1.0 ppm, some even two to three times greater (2.0 - 3.0 ppm).

There is general agreement that this mercury contamination results from atmospheric deposition of mercury—most of which is emitted into the atmosphere by coal-fired power plants, municipal solid waste to energy plants, and medical waste incinerators, probably located in southern New England and New York State. This region-wide problem graphically illustrates the relationship between energy system air emissions and our forest and aquatic ecosystems.

Unfortunately, our forest ecosystems and the health of our residents may not be protected from air pollution by existing electrical energy system air pollution controls. National ambient air quality standards have been established for CO2, SO2, NOx, ozone, and particulates. Recent research suggests that these standards are no longer effectively protecting either human health or the health of aquatic and terrestrial ecosystems.

The key concerns about such impacts relevant to the Northern Forest are as follows:

1. Air emissions impacts are regional, not local. If air emissions create serious problems, they are more likely to have widely-diffused impacts compared with most other air pollution problems—as the entire forest region could be impacted.

2. Mercury contamination results from years of loading.

3. Air emissions impacts are complex and poorly understood.

4. Air emissions are highly complex and poorly understood.

Research to date has tended to focus on single pollutants and impacts of immediate concern (for example, SO2 and acid rain), rather than focusing on the synergistic effects of both near and long term impacts of all atmospheric air pollutants. In addition, atmospheric chemistry is complex and many air pollutants may interact with and alter one another in the atmosphere. Different air pollutants may also produce combined effects on forest systems that can not be attributed to the direct impacts of any

New England Power System at a Turning Point

- Excess capacity presently: approx. 3,000 MW out of 26,000 MW
- But much of NE capacity fragile
- Nuclear
- Oil
- Hydro Quebec contract expirations in 2000
- Economic, electric demand growth resuming
- Energy efficiency capability developed, but not fully deployed
- Advanced renewables capability low at present
- Pressures to deregulate retail system entirely
- Eroding political support for environmental initiatives (e.g. efficiency, externalities).

New England Electricity Mix-GWH (1991)

<table>
<thead>
<tr>
<th>Source</th>
<th>Hydro and Pumped Storage (7%)</th>
<th>Purchases (7%)</th>
<th>Oil (22%)</th>
</tr>
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<tbody>
<tr>
<td>Gas (15%)</td>
<td>Nuclear (30%)</td>
<td>DSM (2%)</td>
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Source: NEPOOL 1991 Annual Report, New England Power Planning; NEPOOL Demand Side Management Committee

Figure 1: New England's reliance on utility-sponsored energy efficiency and load management programs (DSM) is negligible compared to its reliance on conventional generating sources.

Winter Solstice 1994
Meanwhile: Somewhere a New Plant Is Being Planned

The current electrical generating surplus in New England is highly fragile. In particular, New England faces the prospect of early retirement of many of its nuclear plants and coal and oil plants, as well as the expiration of several hydroelectric contracts.

New England may need to construct a significant amount of generating capacity within the next decade. If all or most of this capacity is fossil-fuel based, the environmental consequences for the Northern Forest region are likely to be severe. If cleaner, renewable energy along with more DSM and conservation can be put into place in the region’s power plants are retired and replaced, the Northern Forests and New England will be substantially affected.

Official projections show that the New England power pool will need new power supply capacity by the year 1996. It typically takes at least five years to plan for, site and build a new power plant in New England. Thus, action to meet new capacity needs should be initiated at least five years before the projected need for such capacity.

CLF believes that new power supply-side resources may be well needed earlier than the official date because much currently available capacity could be retired on an unscheduled basis well before currently scheduled retirement dates. We believe that such unscheduled retirements will probably be more important than growth in electrical demand in determining when new supply capacity will actually be needed. (see Box on New England’s Renewable Energy Resources)

Mounting evidence suggests that New England may see a pattern of early retirement of at least several of the region’s nuclear power plants as these plants become uneconomic to continue to operate. A recent report from Wall Street analysts Shearson/Lehman predicted that roughly a quarter of the nation’s 110 operating commercial nuclear plants would be retired within the next ten years due to economics. Many New England plants are likely to be included in this group as they are the oldest nuclear plants of any regional cluster in the nation.

If one assumes that the region’s older nuclear plants are retired about ten years early, this would create a currently unprojected demand for about 3600 megawatts of replacement capacity between 1997 and 2002. The risk of incremental air emissions controls for coal units within New England also may result in pattern of early retirements towards the end of the decade. The most immediate risk to these units is the Phase II ozone smog attainment requirement contained in the federal Clean Air Act Amendments of 1990—which may be quite strict—but this is only one of several incremental emissions control risks faced by these units.

Under some plausible scenarios, a large fraction of the region’s coal units may have to be phased out by the mid-1990s (2005). This fragility is likely to require large investments in new supply to replace unscheduled retirements. This process could begin well before the end of this decade and possibly result in the loss of as much as 3600 MW, or roughly 25% of current NEPOOL installed generating capacity by the year 2005.

New England’s Renewable Energy Resources

Wind

- Resource Base: Technical potential exists to develop several thousand megawatts of currently economically viable wind power technology in New England, generally at coastal and high elevation sites where winds contain the most energy.
- Pollution/Waste Emissions: No direct emissions, except for those associated with manufacturing wind power equipment.
- Availability: Typically wind power systems in New England will produce power during about 30% of the hours in any year. This is about one-half the availability of typical fossil plants and twice the availability of photovoltaic (PV) systems.
- Land Use Impacts: All impacts associated with moderate development, although life cycle impacts are light compared to a standard central power plant (daily human traffic, scenic and auditory impacts). Avian impacts potentially significant depending on site.

Biomass

- Resource Base: Incremental, sustainable New England biomass energy development potential is estimated to be as much as a couple of thousand megawatts. Most of this potential would be produced by replacing existing, inefficient biomass power plants with advanced gasification and power conversion technologies.
- Emissions/Waste: Net CO2 emissions vary by type of biomass feedstock as do other air pollutants. Emissions from conventional biomass power plants are generally comparable to those of natural gas plants. Fuel cells operated on bio-gas (land fill gas, sewage treatment digest gas and gasified biomass) have extremely low air emissions per unit of electrical output consisting only of CO2 and trace amounts of NOx.
- Land Use Impacts: Current biomass technology is relatively inefficient (30%); advanced biomass power technologies are much more efficient (for example, fuel cells operating on sewage gas could be up to 90% efficient).
- Land Use Impacts: Siting impacts are comparable to similar scale fossil facilities. Use of biomass feedstocks (for example, harvested biomass or non energy crops) can impact forest management practices and modify current land uses.

Photo-Voltaic (PV) Power:

- Resource Base: The technical potential to develop PV power in New England is estimated to be up to several thousand megawatts. Currently PV power is far from economic, except in certain, high-value applications which are quite limited.
- Pollution/Waste Emissions: No direct emissions, except for those associated with manufacturing PV power equipment.
- Availability: Typically PV power systems in New England will produce power during about 17% of the hours in any year. This is about one-half the availability of wind energy and about one-quarter that of typical fossil generation.
- Land Use Impacts: PV power systems require substantial area per unit of installed power or energy production. These requirements are somewhat mitigated as they are likely to be frequently installed on the roofs of buildings and eventually as a built-in element of building shells (sidings, windows, etc.).

Hydro

- Resource Base: Some potential exists to improve energy production at existing hydro facilities by improving their operational efficiency. This potential might be as much as several hundred megawatts of capacity.
- Land and Water Use Impacts: Some water might be used for irrigation purposes and some water might be diverted from traditional uses.
- Pollution/Waste Emissions: No direct emissions, except for those associated with manufacturing hydro equipment.
- Land and Water Use Impacts: Hydroelectric projects may have certain positive impacts, such as providing flood control and recreation opportunities.
Electric Utility De-Regulation: An Environmental Strategic Response

by The Conservation Law Foundation

Overview

Recent governmental and utility actions in the U.S. and Europe are changing the way that the electric power industry may look five to ten years from now. Substantial deregulation of rates, utility service obligations, customer choice of power provider, and energy facility siting has already gone forward in the United Kingdom, Norway, and New Zealand. The advent of "retail wheeling" proposals in California, Michigan, Connecticut, Rhode Island and a half dozen other states has forced legislators, other elected officials, environmentalists, utility regulators, and utilities back to fundamentals concerning the role of public policy—particularly environmental policy—in guiding the development of the nation's energy infrastructure.

These de-regulatory trends, without a strong environmental overlay, will almost certainly blunt efforts to move the New England power system towards energy efficiency, cleaner fossil fuel power plants, and renewable energy sources such as wind, solar and biomass. These trends might also result in the greater use of cheap, coal-fired power plants, extended Hydro Quebec contracts and wide scale rate increases for residential and commercial electric customers. Such a result is not inevitable, however. Much will hang on how effective environmental advocates are able to shape the restructuring process.

Background—How Did We Get Here?

The U.S. electric power industry—like most of its counterparts throughout the world—is a highly regulated and centralized affair. Large private companies have been granted monopolies to serve customers in distinct service territories, are required to do so, and must

If electric generation choice is simply left to a wholly unbounded marketplace, as has occurred in England, it is unlikely that clean energy sources will obtain significant market share.

by law build sufficient generating capacity to serve demand at government-regulated rates.

In the last ten years, as a result of litigation by CLF and similar organizations, utility commissions have expanded these utility obligations to include broader environmental and cost control requirements. Environmental groups such as CLF have focused on utilities since the electric power industry accounts for two-thirds of the nation's acid rain deposition, a third of its ozone smog, a third of its greenhouse warming emissions, as well as significant local and regional toxic emissions problems.

These environmentally-inspired requirements have included the implementation of energy efficiency programs (now representing about 1.2% of utility revenues nationally); the selection of cleaner, more efficient smaller power plants over traditional large nuclear and oil- and coal-fired stations; and, more recently, the adoption of renewable energy sources such as solar, wind, geothermal, and biomass. These initiatives—many of which run contrary to traditional utility thinking—have been justified on the basis that electric power provision is planned and paid for on a centralized basis and therefore basic economic and environmental objectives for the system must be established and enforced on a centralized basis; otherwise, utility shareholder interests will prevail over consumer interests.

In the last decade, academics, utilities, and regulators have actively discussed a different, de-regulatory approach that could conflict with the initiatives outlined above. Advances in power plant efficiency and smaller economies of scale; the availability of sophisticated electronic metering and switching; and the impact of increased competition between utilities and independent generating companies spurred by a 1978 federal law—all these trends have led some to argue for expansive deregulation of the power industry—not unlike the deregulation of telecommunication services after the AT&T breakup.

In essence, the proponents of deregulation argue that the original reasons for the utility generating monopoly has ended, and customers should be free to shop around for power, much as customers now shop for long-distance phone service. The utility would retain a monopoly, under these proposals, only on transmitting and distributing the electricity purchased. The utility would have no obligation to provide power; however, the availability of adequate electric supplies would be left to the "free market."

In the last three years, the United Kingdom, Norway, and New Zealand have decided to reorganize their utility industry along these de-regulated lines; similar proposals are being studied and implemented in nearly two dozen other countries, including the United States. Initially in the U.S., this discussion has taken the more limited form of proposals for "retail wheeling." Under "retail wheeling," a retail electricity customer such as a factory would be free to select its power provider ("wheeling" or transmit over the local utility's power lines) from a neighboring utility or an independent private generating company that just built a new plant independently of utilities. However, "retail wheeling" is only a limited form of deregulation: it would not eliminate the utility's legal obligation to serve customers (including customers who choose to shop around for the moment and decide to return at a later time) with adequate supplies—the driver of much of the destructive power plant construction of the last two decades.

The economic and environmental consequences of this form of simplistic retail wheeling will be significantly more negative for all concerned.

From the consumer side, retail wheeling may mean that large, sophisticated customers shop directly for power in a deregulated system, leaving smaller commercial and residential customers to pick up the tab for the large nuclear power stations and other existing capacity projects built by utilities in the 1980's to meet demand; a recent analysis in Rhode Island suggested that remaining customers' rates might rise by 10-20% within one year under a retail wheeling scenario.

From the environmental side, a number of negative consequences could occur:

*Utility-sponsored energy efficiency programs might become more politically difficult to sustain. Today, investment in energy efficiency can be a benefit to all customers by reducing systems power demand, and can be spread around all customers, like the costs of a public phone. Under retail wheeling, a utility has less incentive to invest in energy efficiency in a factory that might not be served by the system for long; likewise, as such customers desert the system, efficiency investments are borne by the shrinking base of remaining customers, driving rates up.

*Carbon, coal and fuel renewable energy plants will be more difficult to get the extent they compete more than dirtier, existing plants. As../../energy efficiency, some customers would be free to desert the system, to escape these higher costs, leaving remaining customers with the bill. Under such a scenario, competitive pressures would discourage utilities from advancing cleaner plants and renewables.

*Correspondingly, under a retail wheeling scenario, in which utilities compete directly on price alone, the surviving utilities might be those with the dirtiest, oldest plants, no energy efficiency programs, and no renewable energy acquisition efforts. In one scenario, energy efficiency and renewable energy development in New England and California would come to a grinding halt.

*Presently, under most state laws, independent power plants may only be constructed if they are demonstrated to state authorities to be "needed." Under a retail wheeling scenario, however, the issue of "need" may become much more complicated, since a plant developer might argue that the existence of retail customers willing to buy the output of the plant meets the legal threshold of need. The result could be that newly more power plants are built than is the case under the current regulations.
Environmental Linkages - New England's Energy System vs. the Northern Forest

In each of the following areas, recent research has raised concern within the forest science community about potential, significant forest impacts. Given the significance of these concerns and how little is yet known about air emissions impacts on the Northern Forest, these concerns suggest that air emissions impacts must be considered as a major (and perhaps the greatest) threat to Northern Forest resources.

A. Nitrogen Deposition: Significant deposition of nitrogen is occurring in the northeastern United States and transportation system emissions of NOx. Much of New England's forest area is nitrogen limited (as a plant nutrient). This means that these forests will use additional nitrogen deposited from the air to produce growth until nitrogen levels exceed plant and soil organism requirements. At this point these forests become nitrogen-saturated. Thus with no mechanism for plant uptake or microbial soil retention, nitrogen begins to leave the system and thus leak, as nitrate into water bodies.

Nitrate leaching into regional lakes has recently suggested to be offsetting the beneficial effects of reduced sulfur dioxide emissions on lakes sensitive to acidification, resulting in increased lake water acidification.

During nitrate leaching, base cations (particularly calcium and magnesium) are removed from the soil, increasing soil acidity and reducing the availability of critical nutrients. Research in Europe suggests that leaching of calcium from calcium-poor forest soils (as a result of acid deposition) has negatively affected songbird reproduction in these areas. A survey of several North American bird researchers conducted by CLF found that while similar reproduction impacts have not generally been observed in the Northeast, this European research raises serious questions about dietary calcium sources and potential calcium deficiency impacts on bird calcium uptake. Calcium deficiency-related reproduction impacts have been observed in some wading birds breeding near acidified lakes in the Adirondacks and eastern Canada.

Nitrogen deposition also appears to increase soil greenhouse gas (NO2) emissions and decrease soil uptake of methane, another important greenhouse gas.

B. Trace Metals Deposition: Cycling: Many trace metals are emitted by New England coal and oil plants and municipal solid waste fueled power plants. These metals include mercury, selenium, arsenic, lead, and cadmium. Until recently, air deposition of these pollutants was resulting in steady accumulation in forest soils.

What Is to Be Done?
The stakes have never been higher for those who care about the environmental import of the region's and the nation's largest industrial polluter - the electricity system. If electric generation choices are to stick to a wholly unbounded marketplace, as has occurred in England, it is unlikely that clean energy sources will obtain significant market share.

Accordingly, CLF, along with several other parties, has recently advanced a proposal to allow market competition within environmental boundaries. The proposal combines several key elements:

- opening up the transmission grid to competition between new and old power plants;
- bringing all old power plants up to new power plant emissions standards, resulting in emissions reductions of 30-60%;
- placing a permanent and declining cap on the New England power system;
- mandating ongoing investment by utilities in energy efficiency and renewable energy, funded by old users of the local distribution system, regardless of who they purchase their power from;
- allowing utilities to recover costs for existing, uneconomic plants while reducing costs to all customers through refinancing. The proposal has received positive reactions from environmental advocates, consumer advocates, many utilities, environmental agencies and utility regulators. Its chances of success - particularly the viability of its environmental features - will depend importantly on how fully the key constituencies pay attention to the issue.

1 This is the pattern that has in fact occurred in the deregulated environment of the U.K.: energy efficiency cannot be rationalized on the basis of avoiding more expensive power supply - since no one has the obligation to make supply investments in lieu of foresee efficiency in the first place.

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The Legal & Economic Obstacles to a Sustainable Energy Policy

Abstract: To have a sustainable energy policy there must exist the legal means to create and implement this policy. Such a policy would presumably require that conservation and development of renewable resources be fully exploited first and then a need for new supply resources be demonstrated. The laws and institutions that permit this development, having evolved to address compartmentalized concerns, no longer are adequate to protect the environment. Legislative and regulatory trends in the electric industry are moving us away from a legal framework that will promote sustainable energy development and use.

Introduction

The proposal to site a wind power megaproject in the Boundary Mountains region of western Maine provokes the question, how did we arrive at the energy policy we now have? In large part the answer is deregulation and economic incentives! This may be surprising to some readers, but a look at the law reveals that we are now seeing the consequences of these two touchstones of the "less government is better government" anti-regulatory rhetoric of the past decade and a half. And it appears more deregulation of the electric power industry is on its way.

The implications for Maine's North Woods are significant. It is a great region of renewable resources, including wood, water, wind and who knows what else. With government incentives to use renewable resources, it is only a matter of time before new technology and the free market come up with increasing numbers of proposals to utilize these resources for profit in the electric power industry. Earlier projects have included hydropower and biomass plants. The latest scheme is the Kenetech Windpower project. Future projects using renewable energy resources in the North Woods could include: wood or peat burning plants, closed-loop biomass plants, hydroelectric power, pumped storage facilities and large-scale wind and solar installations.

Keep in mind that renewable resources exist throughout the state of Maine and elsewhere. To energy developers, what is attractive about Maine's North Woods is the fact that few people live there and major portions of it are owned by a few large corporate landowners. This pattern of ownership and use creates an opportunity not available elsewhere. In the belief that the rejections of energy projects of the past were caused by local opposition and not by fundamental problems with the impacts or scale of the projects themselves, energy developers see the North Woods as the ideal site for a project that might attract significant attention and opposition in a more populous location. Increasing concern about insufficient protection of the North Woods is occurring at the same time as, and perhaps because of, the restructuring of industries as industries move to both create and take advantage of an anti-regulatory atmosphere, before opportunities to site projects on a first-come-first-served basis disappear.

This article takes an initial look at some of the trends in regulation and deregulation in the electric power industry and analyzes some of the differences in the approaches used by various agencies of the Maine government in addressing energy proposals. It is not comprehensive, but is meant to illustrate the premise that we have now actually promoted wasteful and environmentally destructive energy development. It is meant to be a warning to those who would protect the North Woods: know as much about our laws as do those whose business is to exploit the North Woods.

Two Crises—Environmental & Institutional

In 1987, the World Commission on Environment and Development, otherwise known as the Brundtland Commission after Dr. Gro Harlem Brundtland, then Prime Minister of Norway, issued a report in 1987 which made recommendations for dealing with the interlocking issues of environment and development. It was out of this report that "sustainable development" emerged as a major concept.

"Sustainable global development requires that those who are more affluent adopt lifestyles within the planet's ecological means—in their use of energy, for example." This message is not new. In spite of many such calls to action in past decades, much more remains that could be done with energy conservation. What is new is that utilities, regulators and environmental organizations in this country apparently have began to understand the pursuit of energy conservation.

Energy policy has been the subject of many studies and reports by commissions and organizations inside and outside government. For example, environmental, and economic—so that they can be evaluated by people with technical expertise in those areas. Because of gaps in our legal framework, one project may receive primarily an economic review, while another project receives primarily an environmental review.

In some states, the Public Utilities Commission (PUC) has a process for taking into account environmental externalities or costs, but this process may only consider certain costs. For example, the analysis of new supply side resources, those sources producing carbon dioxide emissions may be penalized for such emissions, but those sources that cause significant land use impacts such as large scale hydroelectric, biomass and centralized wind power may not be penalized for their land use impacts. Maine's PUC does not consider environmental externalities.

Environmental impacts are typically reduced to smaller components to be analyzed and if possible, mitigated—effects on fragile soils, existence of endangered species, whether recreation al uses would be affected, toxic emissions, etc. Yet broad-scale and long term problems, such as declining forest health, loss of biological diversity, fragmentation and cumulative impacts on wildlife populations and habitats, will not be adequately addressed when individual projects are examined.

Only projects requiring some federal action will be subject to a federally mandated environmental impact statement (EIS) which requires looking at alternatives including the "no-build" alternatives. For example, a project involving a transmission line that crosses an international border requires an EIS before the federal Department of Energy will issue a Presidential Permit.

More examples of the reductionist approach can be seen in treatment of different components of the electric industry such as wheeling, generation,
energy conservation and renewables, where lawmakers have made changes here and there in an attempt to improve the delivery of the product and service. The problem with the common reductionist approach is that the components of the utility industry do not operate independently and in isolation of each other.

For example, competition introduced by wholesale and retail wheeling undercuts conservation efforts because if customers can switch suppliers at any time, suppliers will try to minimize rates in the short term. In order to minimize rates, utilities will need to promote consumption, increase sales, and maximize use of their facilities, not encourage conservation. Furthermore, since conservation cuts into volume-based profits, and bringing new renewable energy sources on line raises rates in the short term, utilities will avoid these alternatives. One option that has been discussed that would avoid this clash, and do so without opening the industry to the competition that also risks forcing some utilities into bankruptcy, includes linking a utility’s profits to its success in minimizing the economic and environmental costs of electricity services. With deregulation of the electric industry, that option may not be available.

Even if there is agreement as to energy policy, the decision-making framework by which energy projects are licensed varies so greatly from agency to agency and project to project that it may be impossible to implement a sustainable energy policy without significant changes to the relevant institutions and laws. Only public policies of a sustainable energy policy have been established, resulting in major gaps in existing law related to the environment and energy development. Meanwhile, at an accelerating pace, changes in technology have caused energy development and its impacts to outdistance the laws that do exist. The analogy is that of a balloon. As incremental reforms are made to one side, the balloon bulges out the other side.

The longer we continue to delay before adequately dealing with the energy crisis, the more urgent it becomes to act. Without changes in the laws and institutions, the overall energy crisis will worsen and we will continue to react haphazardly to one crisis after another, one proposal after another. The Kenetech wind power project is just one illustration of our inadequate framework for properly dealing with energy developments and the environment. It should be clear that to adequately deal with the energy crisis, we first need to deal with our institutional crisis.

A Closer Look

What laws exist that work in favor of a sustainable energy future? There is one. Maine has, in statutory form, an Energy Policy Act. The problem is that it only applies to decisions that come before the Maine Public Utilities Commission (PUC) and only when the available alternatives are otherwise equivalent in terms of cost and risk. Only Maine electric utilities are regulated by the PUC. Title 35-A, § 3191 states:

Energy Policy: The Legislature finds that it is in the best interest of the State to ensure that Maine and its electric utilities pursue a least-cost plan. The Legislature further finds that a least-cost plan takes into account many factors, including cost, risk, diversity of supply and all available alternatives, including purchases of power from Canadian sources. When the available alternatives are otherwise equivalent, the commission shall give preference first to conservation and demand management, including interruptible capacity resources, and then to power purchased from qualifying facilities. Nothing in this section is intended to modify the commission’s authority under section 3133, subsection 9.

Once again, recall that developers of energy projects may be regulated by different government agencies. Because public utilities are monopolies, the public, through government regulation at the PUC, has been able to establish rules by which public utilities are made to act in the public interest. That has been the trade-off for allowing utilities to be monopolies. At this time, as a consequence of changes in federal and state laws, the electric industry is in transition from being monopoly-dominated to being deregulated in a competitive marketplace.

The fact that Maine’s Energy Policy Act applies only to Maine electric utilities’ plans means that construction decisions made by non-utility power producers such as small power producers, and by large customers who may be able to opt out of the system by producing their own power or purchasing it from out of state producers or utilities, are made without consideration of Maine’s Energy Policy Act.

Under current Maine laws, a Maine utility probably would not get approval to build a coal-burning power plant, but a private entity probably could. In fact, a coal-burning cogeneration electric plant was built in Rumford, Maine, in the late 1980s, by the Boise Cascade paper mill. The power is sold wholesale to the electric utility.

Utilities must obtain from the PUC a Certificate of Public Convenience and Necessity for either construction of a major generating facility or transmission line (over 1000 kilowatts in size or transmission lines carrying over 100 kilovolts), or purchase of generating energy or transmission capacity. Generally, the major question is one of need. As required by the Maine Energy Policy Act quoted above, the proposed power purchase also has to be superior to the alternatives of conservation and demand management and power purchased from qualifying facilities. These are economic questions.

The history of the law on the PUC certificate of need for generating facilities illustrates how the electric power industry was more regulated in the past than it is today. In an earlier version, 35 MRSA § 13-A (1964), the findings of need required of the Commission were virtually the same. However, before 1977, this law applied to all “electric companies,” defined in 35 MRSA § 15 (1964) as “every corporation or person, their lessees, trustees, receivers or trustees appointed by any court whatever, owning, controlling, operating or managing any electric plant for compensation within this state, except where electricity is generated on or distributed by the producer through private property alone solely for his own use or the use of his tenants and not for sale to others” (emphasis added). In other words, it would have applied to any commercial power producer, not just utilities.

Winter Solstice 1994

The Northern Forest Forum
Today, the requirement to obtain a certificate of need applies to electric utilities, but not to private interests producing their own power, nor to independent developers of small energy production facilities using renewable resources and cogeneration facilities.\(^5\)

The independent power segment of the electric energy marketplace expanded over 15 years ago in order to promote energy self-reliance in response to the Arab oil embargo of the 1970s. The PUC does not consider whether the construction of an independent production facility will meet the PUC's criteria of need. Now it is the marketplace, and available data, that determines, as well as all projects are proposed. A change in our laws would be needed to require all electric energy development proposals to go through a review of need before a permit would issue.

Need obviously is a very complicated issue. The PUC law implicitly requires a utility to explore the alternatives, including conservation, thoroughly and to demonstrate the superiority of the utility's proposal, in a quasi-judicial setting, following the same type of evidence that would apply in a court of law. For example, the mere existence of a contract for purchase of power is not adequate proof of need.

"Need" can be defined differently by different agencies. The Maine Department of Environmental Protection, for example, issues permits for projects in the organized municipalities, treats energy projects just like any other type of development and does not analyze whether there is a need for a project. As noted above, the PUC has relatively well-defined criteria and "need" at the PUC is more of a legal term than what we would think of as "need." There must be findings that the facility is necessary and that the resource is part of the utility's overall least cost plan.

When the Maine Land Use Regulatory Commission (LURC) recently examined policy issues associated with rezoning and developing high mountain areas in unorganized townships for energy facilities driven by wind power, a discussion around the need criterion set forth in the LURC statute\(^6\) raised many questions as to how need should be measured and evaluated. Some commissioners appeared to be at a total loss as to how need should be defined.\(^7\)

This points to another difference between LURC and the PUC. LURC is made up of citizens living in or near Maine's unorganized townships, the PUC is a panel of professionals who typically have backgrounds either in finance or in law. Legal and technical advice is more readily available to the PUC. In every case before the PUC, there is the involvement of an advocacy staff, which takes a position on the proposal that represents what is in the best interests of the entire state of Maine, not just consumer or utility. The Public Advocate represents consumers views before the PUC. LURC has no such advocacy staff or Public Advocate, and intervenors are perhaps intended to fill that role. But that works only if intervenors indeed become involved in the case and take meaningful positions.

Furthermore, in order for there to be a public hearing, someone must request one, have a stake in the application. Someone must also have the resources to develop a position in the case. In this sense, many decisions made by the LURC are "discretionary." If no one opposes a project, then even if the decision was legally without basis, no one will appeal the decision to a court of law.

Other Trends

With the deregulation of the electric industry, less of the electricity industry is answerable to the public interest. While conservation is seen by the public as the best alternative to pursue first, conservation policy has very little teeth now. If need had to be demonstrated by showing that pursuit of conservation measures is inadequate to meet future demand, then conservation really would have to be pursued first, but that is not now generally the case.

Today conservation is not being pursued aggressively by utilities because there is a surplus of power in the region resulting from over-projection of need made by utilities during the 1980s. Because of the resulting glut of cheap power, utilities have renegotiated or otherwise bought out some power purchase contracts from small power producers. For example, in October 1994, Central Maine Power Co. purchased a Fort Fairfield, Maine, wood burning electric plant as part of this effort to get out of small power contracts. The biomass plant will run for at least three more years while CMP attempts to reduce the plant's operating costs.

Some renewables nonetheless are being promoted. The federal Energy Policy Act of 1992 contains a provision for a production-type credit against income tax liability for electricity produced from wind energy. This tax credit is available for the first nine months of a closed-loop biomass facility.8 "Closed-loop" is defined in the statute as any organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity. For example, "green power" generated from "closed-loop biomass" facilities.8 "Closed-loop" is defined in the statute as any organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity. The credit is 1.5 cents (adjusted for inflation) per kilowatt hour of electricity produced from those sources placed in service after December 31, 1992 (December 31, 1993 in the case of a closed-loop biomass facility) and before July 1, 1999. This is a general business credit available only for power sold to an unrelated customer.

The Future

Current law affords some protections that are consistent with a rational and sustainable energy policy, but those protections are very limited and technical advice is more readily available to the PUC. In every case before the PUC, there is the involvement of an advocacy staff, which takes a position on the proposal that represents what is in the best interests of the entire state of Maine, not just consumer or utility. The Public Advocate represents consumers views before the PUC. LURC has no such advocacy staff or Public Advocate, and intervenors are perhaps intended to fill that role. But that works only if intervenors indeed become involved in the case and take meaningful positions.

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An ill-advised proposal for a cargo port on Sears Island, Maine would enable Maine landowners to export woodchips. Currently, both New Hampshire and Maine public utilities are buying out the contracts of biomass plants so that the expensive energy contracts can be retired. Meanwhile, despite all the rhetoric about wind being a renewable energy source, forests are being liquidated by woodchips. This photo shows the pristine and undeveloped eastern shore of Sears Island. Photographer John McKeith walked two hours without encountering another person.

transmission right of way, clearings for roads, facilities and overhead connector lines on 1,442 acres "environmentally benign." For another example of how this tax credit may be used, consider that although the Fort Fairfield plant just purchased by Central Maine Power Co is not a wind energy facility, it cannot be too far-fetched to imagine LURC considering a future application to plant and grow non-native vegetation with high fiber-producing potential on cleared land to fuel the Fort Fairfield plant, thus qualifying it as a closed-loop biomass plant for the tax credit.

In the future, with the federal Energy Policy Act of 1992 allows states to decide whether or not to allow retail wheeling of electricity, or electricity shopping. Federal law already requires utilities to wheel power for wholesale producers. In summer 1994, the California PUC has issued an order that will allow retail wheeling to all large industrial customers starting on January 1, 1996. By the year 2002, even residential customers in California will be free to purchase power from other suppliers. Tactics are likely to be similar to those in the now deregulated telecommunications industry. An advertising analyst for a telecommunications firm said that power companies will offer "bonuses for switching and incentives to stay," just like the telephone company. Obviously, advertising and self-promotion will result. It's not too hard to envision the possibilities if retail wheeling hits the eastern United States too—for example, from wood, water and wind resources in the North Woods could be in great demand by southern New England utilities.

The Federal Energy Policy Act that promotes democratic control over the powerful electric industry, Maine law gives authority to municipalities to form such public power authorities. The federal Energy Policy Act of 1992 also makes it easier for local public authorities to wheel wholesale power from far away. However, public power companies are just as capable as private companies of massive environmental destruction. It remains to be seen whether municipalities in Maine will implement meaningful conservation programs and sustainable energy policies, or whether they will just buy cheaper power from polluting sources in order to obtain lower rates for their own customers.

Some renewables nonetheless are being promoted. The federal Energy Policy Act of 1992 contains a provision for a production-type credit against income tax liability for electricity produced from wind energy or "closed-loop biomass" facilities.8 "Closed-loop" is defined in the statute as any organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity. The credit is 1.5 cents (adjusted for inflation) per kilowatt hour of electricity produced from those sources placed in service after December 31, 1992 (December 31, 1993 in the case of a closed-loop biomass facility) and before July 1, 1999. This is a general business credit available only for power sold to an unrelated customer.

The legislative history of the federal Energy Policy Act reveals that an important purpose of this tax incentive was to increase use of renewable energy because "[t]he increased use of solar, wind, biomass, and geothermal energy will provide environmentally benign energy, create economic benefits and increase the security of energy supply."9 However, it is questionable whether anyone would call the Kenetech megaproject, with its 37 turbine strings on 25.7 miles of high mountain ridges, 108 foot diameter blades, 100 foot wide
Equally problematic is that we don’t react soon enough, and there is much to react to these days. This is particularly true with pollution and environmental harm. “We are accustomed to look at the gross and immediate effect and to ignore all else. Unless this appears promptly and capriciously, we are apt to think that it cannot be ignored, we deny the existence of hazard.”

Should the marketplace continue to decide whether and which new power plants get proposed and built? Can we rely on plants get proposed and ecological decisions? Or should to determine what is the best energy sources that are wvying Department brought est in energy issues as well as Northern Utilities which is inferior or detrimental, as , torg about Utilities_Institute and Development, From One Earth to One World: An Overview by the World Commission on Environment and Development, published by the Macmillan Publishing Company, 1992.

Photonsys

A number of photonsys are clearcut forests to undis- turbed forests. Undisturbed forests do not necessarily support larger bacterial populations, but are able to use a large portion of nitrogen that is converted into a useful form by the soil bacte- ria, thereby recycling this important mineral more efficiently. Ultimately, the energy stored as chemical bonds in food and not lost as heat is passed to decomposers (fungi and bacteria). This is a crucial step in mineral cycling but the last step in the energy “cycle.” All new metab- olic energy must come from continu- al photosynthetic capture of solar radi- ation. Ninety percent of the standing biomass on earth today is in the form of trees, and together, the forests of the world hold an energy content that is equivalent to the total proven reserves of fossil fuel (including gas, oil, and coal)!

Greg Lowenberg is Professor of Biology at Middlebury College.

The Book of Job’s Environmental Message


Noted environmental author and social critic Bill McKibben (an Adirondack neighbor to the Vermont Natural Resources Council), looks to the Bible for “a new paradigm” in order to reverse the seemingly headlong rush in some quarters to destroy the environment. It’s to the Book of Job, and not the usually quoted Genesis he has turned to produce a deeply moving, thoughtful, and powerful call for human humility in Job’s pattern.

“Humility first and foremost is Job’s reaction to a rapidly growing body of thought and writing in the religious world’s connection to our natural envi- ronment and its care and stewardship.

---Reviewed by Bren Whittaker, Episcopal Ministe of the now-defunct Northern Forest Lands Council, and VNRC’s Northern Forest Project rep in the Northeast Kingdom.

From Comforting Whirlwind

As I write these words, the 1992 presidential campaign is in full swing. That campaign and his administra- tion ended, President George Bush, speaking to a group of religious leaders, said that while the Democrats had a whole lot of words in their platform, nowhere did the word “G-O-D” appear. Not once. A president should believe in God, he continued.

A few days later, on an election-cifying trip through Oregon, the presi- dent announced that he was going to try to open up more of the old-growth forests on federal lands to timber harvest.

The logging had been halted to protect the habitat of the spotted owl, but President Bush had said, going to let some “furry, feathered bird” get in the way of prosperity. In fact, he said he wouldn’t extend the Endangered Species Act when it came up for renew- al unless it was radically redesigned to prevent any serious economic impact.

Editorialists and commentators analyzed both positions and asked what the consequences would be around us, struggle to this planet “with other species” H that while the Democrats had a whole lot of words in their platform, nowhere did the word “G-O-D” appear. Not once. A president should believe in God, he continued.

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Maine Audubon Offers Proposal for Protecting the Best of the Northern Forest

Ed. Note: The following preliminary proposal is reprinted from Habitats: Journal of the Maine Audubon Society, vol. 1, no. 4 Fall 1994. M.A.S believes is representing a starting point for delineation areas strategies to develop sustainable natural and human communities.

The Issue: A Resource at Risk

The largest tract of undeveloped land remaining in the eastern U.S. is right in our own backyard. Spanning more than 13 million acres of northern and eastern Maine, it is an area of unparalleled significance for wildlife habitat, biodiversity, and forest resources. Various called the Maine Woods, the North Woods, or the Northern Forest, this region is key to the foundation for the ecology, economy, social character, and historical identity of much of New England.

But this legacy is vanishing. Piece by piece, the remote and still unspoiled nature of Maine’s Northern Forest is disappearing. Each year new roads reach further into these woods, opening up once largely wild areas. Increased timber cutting is fragmenting or destroying wildlife habitat. Ever greater numbers of people are crowding the rivers, trails, and campgrounds. Vacation homes are sprouting up, along with political and economic pressures for development. And changes in global economies is eliminating once-stable jobs in local communities. These changes are leading to the destruction of wildlife habitat. Ever greater numbers of people are crowding the rivers, trails, and campgrounds. Vacation homes are sprouting up, along with political and economic pressures for development. And changes in global economies are eliminating once-stable jobs in local communities.

Conservation Priority Areas

At the heart of Maine Audubon’s plan are five proposed conservation priority areas: White Mountains, Western Mountains, Northern Forest, Great Bay, and Downeast Lakes. Ranging in size from 200,000 to 900,000 acres, each of these areas contains a concentration of ecologically sensitive features and a need for special protection stemming from special local or regional special attention.

The five proposed CPAs are the target of an extensive new analysis of the inventory database by Maine Audubon and colleagues and represents the second of several stages of a comprehensive CPA planning process in the Northern Forest. Among multiple-use areas, CPAs would still allow limited harvesting, hunting, and other traditional uses. But in these areas, no communities would have to undertake large-scale changes in development patterns to maintain a tourism-based economy. As multiple-use areas, CPAs would still allow limited harvesting, hunting, and other traditional uses. But in these areas, no communities would have to undertake large-scale changes in development patterns to maintain a tourism-based economy.

The Emergence of a Plan

The need for a plan to protect the Northern Forest grabbed the public’s attention in the late 1980s after the sale of millions of acres of the Northern Forest. As early as 1990, the idea began to emerge that the Northern Forest could be preserved as a large, intact, and pristine lakeshores. And changes in global economies are eliminating once-stable jobs in local communities.

Recognizing that the size and importance of the Northern Forest was still unspoiled and that it needed special management. Site-specific management agreements with willing landowners, however, could protect deer yards and selected habitats for rare and endangered plants and animals.

Managed Forest Lands

Surrounding the CPAs, managed forest lands would continue to dominate the Northern Forest landscape. These lands would provide the seminatural forest setting essential to maintaining the integrity of CPAs as intact ecosystems. As with the CPAs, lands especially suitable for forest management need to be mapped and identified. The ongoing challenge for the environmental community will be to make the case for enlightened forest practices on these lands in both biological and economic terms.

Economic Growth Areas

Although the economic well-being of the human communities in and around the Northern Forest closely correlates with the environmental health of the forest itself, any successful conservation plan for the region must also incorporate community needs. The ground-work for establishing sustainable local economies will require research and planning to identify economic growth opportunities for the region that capitalize on its existing infrastructure and workforce. Once these economic growth areas are identified, work can begin to encourage development.

An Idea with Advantages

The concept of establishing several separate CPAs in the Northern Forest has several important advantages over other recent proposals to protect one large contiguous area as a national park or similar designation. Most obvious is that it allows for the protection of many of the most ecologically sensitive and recreationally valuable areas throughout the Northern Forest and not just those given in a given area. Second, it distributes the impact of large-scale land protections among private, national, and international communities around the Northern Forest. As multiple-use areas, CPAs would still allow limited harvesting, hunting, and other traditional uses. But in these areas, no communities would have to undertake large-scale changes in development patterns to maintain a tourism-based economy. As multiple-use areas, CPAs would still allow limited harvesting, hunting, and other traditional uses. But in these areas, no communities would have to undertake large-scale changes in development patterns to maintain a tourism-based economy.
TO PROTECT: ON PRIORITY AREA HIGHLIGHTS

**DOWNEAST LAKES**
- 784,000 acres
- 85 lakes with 678.1 miles of shoreline
- 0.33 miles of road/square mile of area

Flora and Fauna of Special Concern
- confirmed Canada lynx habitat
- 2 bald eagle nesting sites
- 2 black tern nesting sites
- 7 rare plant species
- 7 old-growth forest sites

Recreational Highlights
- 651 wetlands over 10 acres (47,220 acres total)
- 13 mountains over 3000 feet
- 268 miles of scenic roads
- 57 backcountry campsites
- 2 black tern nesting sites
- 7 rare plant species
- 7 old-growth forest sites (124 acres total)

**GREATER BAXTER**
- 821,000 acres
- 13 mountains over 3000 feet
- 184 lakes with 769.1 miles of shoreline
- 0.18 miles road/square mile

Flora and Fauna of Special Concern
- 42 species of rare plants
- rare arctic-alpine vegetation
- 14 old-growth forest stands (3040 acres total)
- 415 wetlands over 10 acres (21,384 acres total)

Recreational Highlights
- 280 miles of hiking trails
- 59 miles of snowmobile trunk trails
- 85 outstanding fishing lakes
- 96.5 miles of fishing rivers
- 12 scenic waterfalls and gorges
- 65 miles of scenic roads
- 6 campgrounds
- 126 backcountry camp sites
- 59 bald eagle nest sites
- 65 miles of skiing trails
- 41 miles of whitewater canoeing
- 45 miles of snowmobile trunk trails
- 51 outstanding fishing lakes
- 113.5 miles of river fishing
- 117 miles of scenic roads
- 57 backcountry campsites

Map by Barbara Charry
Land Conservation Options

Options for Private Landowners

With 95 percent of Maine in private ownership, the future of many of the state's most important natural and recreation areas rests with individual landowners and not the public. Yet, because many public values are inherent in private land, the pressure on landowners to bear the responsibility and costs for protecting these values is mounting. Fortunately there is an array of creative ways private woodland owners can protect their property's natural values without relinquishing their rights to use and profit from their land.

Certified Timberlands. Increasing demand for green products can be a major incentive for companies to use resources in ways that reduce or minimize harm to the environment. It is also no less true for the wood-products industry, where timber "certified" as being harvested on a sustainable basis and under conditions sensitive to the environment is in high demand. Seven Islands Land Corporation is the first Maine company to receive international green certification for its timber products.

Conservation Easements. The popular option for many landowners who want to retain title to their land and want to protect its natural values is a perpetual conservation easement. This legal contract permanently restricts future development on a given parcel of land and is easily customized to match the needs of the individual landowner. If the easement offers public benefits, there are often substantial tax savings as well. Great Northern Paper Company, for example, donated easements prohibiting development along the East and West Branches of the Penobscot River to the state of Maine.

Corporate Protection Initiatives. Conservation is good for business, especially when it comes to generating positive publicity. One way corporate landowners have accomplished this is by developing their own inventory of special places and creating protection for them. A good example is Champion International Corporation's "Special Places in the Forest" program. Two areas protected under this program are a 160-year-old stand of red pine along the headwaters of the Machias River, and Holmes Falls for its waterfalls and historical importance during the log-driving days.

Partnerships with User Groups and Conservation Organizations. When intense or increasing public use of a private resource becomes a challenge for landowners, the creation of partnerships with user groups to manage access, litter, safety, and stewardship can provide a cost-efficient way of managing the situation. The Maine Island Trail Association, for instance, maintains recreational access to a network of public and private islands, helping owners of coastal islands with fire safety, litter and erosion control, and protection of fragile areas.

Resource Protection Plans. Landowners whose property lies within the Land Use Regulation Commission's jurisdiction (which includes most of Maine's Northern Forest) can negotiate resource protection plans that are detailed and specific for an area within their ownership. In these plans, recreation, wildlife habitat, public access, timber harvesting, and road building standards are all precisely defined, thereby greatly streamlining the land use permitting process. Typically the plan must be renegotiated after a specified period. Ten landowners along the St. John River have already negotiated such a resource protection plan for a ten-year period.

With Maine's economy tied to tourism and more than 70 million people within a day's drive, it is clear that land acquisition will be an important strategy in managing and protecting the Northern Forest's ecological and recreational values. This is particularly true for undeveloped lakes and river shores where heavy or increasing public use is restricted, specialized wildlife habitat that is not compatible with commercial forest use, and public lands and other properties with outstanding natural features. There are several proven mechanisms for managing this land.

The Maine Bureau of Public Lands manages 485,000 acres for many uses, emphasizing the appropriate "dominant use" of a given area, whether it be for wildlife habitat, recreation, or timber harvesting. The Richardson Lake Management Unit in Northern Oxford County is one example.

With Maine's Audubon Society offers this drawing to illustrate possible land management designations on a hypothetical conservation priority area. Illustration by Bob Hooper

Strategies for Conserving Public Land

This 23,000-acre parcel is managed for recreation in the areas near the lakeshores, and for commercial timber production in the extensive interior hardwood stands.

Wildlife Management Areas. Maine's Department of Inland Fisheries and Wildlife manages 75,000 acres of public land for wildlife and its habitat. The Gordon Manuel Wildlife Management Area in Hodgdon, for example, is a nearly 6000-acre site with a variety of habitats including a deadwater with boat access, wetlands, redwood forest, and agricultural fields managed for wildlife use.

State Parks. Except for 200,000-acre Baxter State Park, most of Maine's parks are small and primarily provide access to trail and water resources and/or providing amenities for large numbers of day and overnight users. Park management is often the appropriate management tool to handle areas of high public use and demand, but without proper funding, increasing or even maintaining our state parks is a problem.

Land Trusts and Nonprofit Conservation Holdings. Although lands acquired by nonprofit organizations and trusts are not usually sizable, they often represent outstanding ecological or popular local landscape features. Donating or selling land to these nonprofit groups often relieves landowners' tax burdens and allows them to keep large parcels intact while continuing to have use of their land. The Rangeley Lakes Heritage Trust protects a large tract of land on Cupoaguc and Mooselookmeguntic Lakes, including shorefront, campsites, trails, and mountains.

Federal Lands. Conservation land in Maine owned by the federal government is of three types: National Park, National Forest, and National Wildlife Refuge. National Parks of which Acadia is one of the nation's most popular are managed primarily for recreation and ecological values. National Forests are managed for a range of values, from designated wilderness to timber harvesting. The portion of White Mountain National Forest that spills over into Maine includes the 12,000-acre Caribou-Speckled Wilderness Area. National Wildlife Refuges are managed principally for their habitat values. The major management focus of Monsonhorn National Wildlife Refuge in Calais is to provide habitat for American woodcock and ruffed grouse.
Maine Audubon Society's Proposal—Deeply Flawed, But a Welcome Offering

by Jamie Sayen

Maine Audubon Society’s (MAS) proposal for designing Conservation Priority Areas (CPAs) in the Maine Woods, “Defining Our Priorities,” is a welcome, but profoundly flawed, contribution to the public discussion over the future of the region’s forest ecosystems. MAS has shown the courage to define its terms and offer the Northern Forest community a concrete proposal to criticize.

The rest of the environmental community should offer proposals of their own or endorse either the MAS proposal printed in this issue on pages 16-18, or the RESTORE: The North Woods proposal for a Maine Woods National Park (see Forum, vol 2, #6, pages 10-11), or the Thoreau Regional Wilderness Reserve proposed by Rudy Engholm and me (see Forum, vol 2 #3, pages 4-5).

When evaluating proposals for wildlands reserves, we must ask if the proposal meets the four criteria outlined by Reed Noss in “The Wildlands Project: Land Conservation Strategy” in (The Wildlands Project Special Issue of Wild Earth, January 1993, page 11): 1) Represent, in a system of protected areas, all native ecosystem types and seed stages across their natural range of variation. 2) Maintain viable populations of all native species in natural patterns of abundance and distribution. 3) Maintain ecological and evolutionary processes, such as disturbance regimes, hydrological processes, nutrient cycles, and biotic interactions, including predation. 4) Design and manage the system to be responsive to short-term and long-term environmental change and to maintain the evolutionary potential of lineages.

The MAS proposal may: 1) protect some—but not all—native ecosystem types and seed stages; and 2) maintain viable populations of some—but not all—native species in natural patterns of abundance and distribution. It is unlikely to adequately maintain ecological and evolutionary processes, nor is it likely to be sufficiently responsive to short and long-term environmental change, nor to maintain the evolutionary potential of lineages.

In short, the CPAs identified by MAS contain many of the pieces necessary to achieve the goals articulated by Noss, but there are huge gaps and MAS’s proposal for managing the CPAs it has selected undercuts, rather than promotes, the protection of regional biotic integrity.

Flawed Inventory: MAS cites “An Inventory and Ranking of the Key Resources of the Northern Forest Lands of Vermont, New Hampshire and Maine” (hereafter cited as “Resource Inventory” or RI as its “database” for developing its proposal. While the RI contains some important information, it is a limited and superficially flawed study that offers scant guidance in meeting the four criteria listed by Noss. (See an in-depth critique of the RI on page 20)

Conservation Priority Areas: The generally accepted model for ecological reserve design is a network of core reserve areas that are buffered from development and intensive forest management and connected with other core areas. Core reserves are essentially wilderness. (See Noss, Op. Cit., pages 10-25)

There is general agreement among the groups belonging to the Northern Forest Alliance that within the core wildlands areas, large portions must be purchased by the public and managed as wilderness. No forestry or development will be permitted. Buffer zones around the core areas can be a mix of public and private ownership. Development will not be permitted in the buffer zones. Low-impact forestry can be conducted, provided it follows stringent ecological guidelines that help protect the ecological integrity of the entire area. In short, the number one priority for core wildlands areas is the protection of biotic integrity; other human activities will be permitted only as they do not compromise the region’s biotic integrity.

MAS defines its CPAs as “multiple use areas” that would permit timber harvesting and “other traditional land uses.” MAS suggests that a “broad array of public and private resource protection strategies would be employed,” and its conceptual map of a “hypothetical CPA” shows that in a sea of private working forest, the CPAs would have small Maine Bureau of Public Lands holdings managed for timber and even smaller ecological reserves of perhaps 1000-2000 acres. It even contains “residential development zones.”

MSC’s concept of a CPA more closely resembles a strategy for a buffer zone (although buffer zones should not permit “residential development zones”). In effect, MAS has eliminated the most important component of a reserve strategy—the Core wildlands— and replaces the buffer zone a CPA.

MAS says its CPAs are a concept that is “flexible and proven.” Actually, the MAS approach represents a modest modification of the status quo in much of the region—not a new approach to the region’s ecological crisis. As designed, the MAS CPAs will not protect the region’s biotic integrity.

Reserve Size: The hypothetical map provided by MAS suggests that eco-reserves could be very, very small—1,000-2,000 acres. This opinion is not shared by conservation biologists, most of the region’s environmental groups, or much of the public that testified at NPLC Listening Sessions last spring. If we are going to restore and protect the integrity of the region’s biotic communities, if we are going to have a chance to restore wolves, cougars, wolverines, lynx, and caribou, core wildland areas must be much larger. A few reserves in Maine must greatly exceed the size of 200,000-acre Baxter State Park.

The quality of wilderness cannot be restored by postage stamp eco-reserves.

Selection of CPAs: Other groups have conceptualized the information that has been able to guide us in choosing the right areas. The State of Maine has shown the courage to define its terms and offer the public discussion over the future of the region’s forest ecosystems.

But, even the new Republican-controlled Congress is unlikely to simply throw money away at the national level. The only other source of funding from the State: the now unfunded Land for Maine’s Future and a proposed lottery that will not set significant funds for wilderness acquisition.

Forest Practices: The section on “Managed Forest Lands” is confusing. There doesn’t seem to be much difference between the managed forest lands inside MAS’s proposed CPAs and the managed forest lands outside the CPAs. Apparently, logging will continue to dominate both categories. MAS does not tell us how we are going to assure “enlightened forest practices.” It does not mention regulations or sustainable practices. Worse, it places the burden of proof on environmentalists to “make the case for enlightened forest practices on these lands on both biological and economic terms.” Isn’t it time MAS and all responsible citizens and advocates insist the burden of proof rest with those whose proposed actions might have adverse biological impacts? The unexamined assumption of MAS’s argument is that owners are entitled to continue to trash their lands until we can make the case for responsible, sustainable management.

Easements: Conservation easements can play an important role in buffering core wildlands areas and provide...
The ‘Resource Inventory’ Lacks an Ecosystem Perspective

"We do not suggest that this inventory in any way directly describes the biological diversity of the study region."

"Data on the occurrences of rare plants, rare natural communities, and rare animals in the study region are notably incomplete because not all of the Northern Forest lands have been adequately inventoried."

"We realize that information gaps affect our evaluation of these results."

"Sally Stockwell and Barbara Charry, Maine Audubon Society, in "An Inventory and Ranking of the Key Resources of the Northern Forest Lands of Vermont, New Hampshire, and Maine" by Appalachian Mountain Club, Audubon Society of New Hampshire, and Maine Audubon Society, September 1993, page 21"

"In "Defining Our Terms: Maine Audubon Society's Proposal for Protecting the Best of the Northern Forest," we read: "The completion of the inventory [of physical, ecological, recreational, and development features] provided the first and only reliable estimate of the full fee purchase price, yet permit the landowner to select different cut-off points for NH-VT and for Maine. It is extremely dubious that this sort of rating system could pass any sort of scientific peer review."

"Lacks Ecosystem Perspective: Points are only awarded for existing data, and there are significant information gaps, especially in Maine. Most of the data is "point data"—location of old growth or rare species—and lacks an ecosystem perspective. Accordingly, the inventory is useful in locating specific sites requiring protection, but is of scant value in designing a reserve system that seeks to protect ecosystems and processes such as disturbance and natural succession. Over-reliance on this sort of inventory promotes a continuation of failed conservation strategies that protect small isolated fragments rather than the larger reserves favored by most conservation biologists."

"Omissions: While most of the categories rated by the Inventory are important, many other essential categories were not included in the ratings. Omissions include: extirpated native species such as wolves, cougars, wolves, lynx, and caribou; populations of large wide-ranging species; representatives of all major ecosystems and all seral stages within each type; centers of ecological richness and endemism (not just centers of rarity)."

"Incomplete Inventories: As Stockwell and Charry acknowledge, data on rare plants, animals and natural communities are "notably incomplete" because large portions of the region have not yet been adequately inventoried. Only about a quarter of Maine has been inventoried for rare plants, yet the Inventory went ahead and assigned points for areas providing habitat to rare, threatened and endangered species. Areas without rare, threatened and endangered species received zero points. So did the three-quarters of the state that has not been inventoried. Since low point totals were used to eliminate areas from proposed CPAs, uninventoried areas were treated as though they had been inventoried and were without rare, threatened and endangered species."

"Given the magnitude of the incomplete inventories, the only conclusion to be drawn from available data is: we have identified some areas known to possess rare, threatened and endangered species and natural areas. Until adequately inventoried from an ecosystem perspective, all other areas must remain as candidates for protection. Unfortunately, MAS has eliminated these uninventoried areas (unless they scored high in other categories)."

"Epaitemated Species: The Inventory does not include data on the habitat and range of extirpated species, especially large, wide-ranging predators such as wolf, wolverine, cougar and lynx. This biases the results of the inventory against restoration and against large wildlands areas and condemns us to accept current levels of ecological impoverishment. Thus, over-reliance on the Inventory produces old-style conservation strategies that preserve a few museum pieces, instead of the strategy of today's conservation biologists who generally agree that large reserves are more likely to be richer in species diversity and biotic integrity than small, isolated reserves such as the 1,200-2,000 acre reserves proposed by MAS."

"Inventory Inaccuracies: An inventory of such a large area invariably overlooks important details. When the Randolph, Conservation Commission produced a "Natural Features Inventory of Randolph, N.H.,” it discovered several significant errors in the RI. Whereas the RI stated Randolph had no rivers or waterfalls, there are actually three rivers, ten named brooks and several named waterfalls. The RI said there were no rare natural communities or old growth stands, whereas Randolph possesses three rare natural communities and one old growth stand. The RI reported no rare animals and no waterfalls are found in Randolph; in fact there are two rare animals and one wetland greater than ten acres."

"MAS Deleted Areas Identified by the Inventory as Significant: An accompanying map, from page 37 of the RI, shows the areas deemed most ecologically significant by the RI. For reasons unexplained by MAS, areas E-8, E-11, E-13 and E-14 are not included in MAS’s proposal. These areas are nearer developed areas, and hence may run into more anti-environmental hostility, but they are all the more important as refugia of biodiversity in a developed landscape."

Flawed, But Welcome

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"Taking recreation corridors, especially if the estament is developed. Purchased easements often cost 50-60% of full fee purchase price, yet permit the landowner to clearcut, build logging roads, and spray herbicides. Easements are an expensive and ineffective way to protect core wildlands areas. Limited acquisition funds, in general, are better spent acquiring full fee ownership of land."

"Green Certification: If properly conducted, a program that reliably certifies the sustainable management practices of a landowner can be of value in protecting timberlands and promoting more responsible consumer habits. MAS, unfortunately, touts the recent, highly publicized certification program invented by Seven Islands as an example. Yet, despite granting Seven Islands certification, Scientific Certification Systems found that Seven Islands’ harvesting exceeds the calculated allowable harvest. The independent conversion to low-value, unnatural forest communities, applies silvicultural guidelines inconsistently, causes a decrease in biodiversity, lacks a formal wildlife plan and cuts too close to streams for optimal sediment filtering. In addition, Seven Islands is the largest exporter of raw logs—and value-added jobs—from Maine."

"Conclusion: The MAS proposal is little more than a modest reform of the status quo, and it will not preserve and restore the region’s biotic integrity. Nevertheless, it is a welcome entry in the debate over the future of the Maine woods. It helps clarify many issues, and it certainly will prompt debate and discussion can lead us to the policies necessary to assure sustainable natural and human communities in the region. Silence is the real enemy."
Grassroots Coalition Promotes Wolf Restoration in Maine

by Fife Hubbard

A new organization dedicated to restoring wolves to Maine has emerged in the state's capitol. The Maine Wolf Coalition (MWC), a grassroots group founded by John Glowa of South China, Maine, supports wolf recovery through research, education and protection. The Maine Wolf Coalition is positioned to fill a vital niche in the public policy debate over whether wolves will be welcomed by Mainers to return to their native forests.

The cornerstone of the MWC program is contained in its first newsletter: "... regardless of whether one supports or opposes wolf recovery, it is of the utmost importance that the public be involved in the decision making process and be kept informed in order that decisions that form public policy be based upon facts, not upon unfounded rumors, assumptions, innuendoes, fears or political biases."

"Wolf Facts"a, a section of the organization's newsletter summarizes some of what has been learned about the status of the wolf in the northeast, restoration possibilities, and what the presence of wolves could mean to the people of Maine. Here are some excerpts:

"In August of 1993 a two year old female wolf was shot in Russell Pond Township, ME, indicating that wolves are presently ranging through Maine searching for suitable breeding territory.

"Breeding populations of wolves exist to the North and East of Quebec City (75 miles from the Maine border).

"Wolves have known to disperse over 500 miles from their former pack's territory.

"Wolves feed primarily on ungulates (moose and deer in Maine) with beaver being favored prey during times of open water.

"This year's pre-season ungulate population in Maine was estimated at 300,000 animals. Recent year's records of reported kills during hunting season show an average of 27,000 animals taken. Another 27,000 are assumed to be taken by wolves.

"In Wisconsin (where there are no moose) estimates show each wolf takes approximately 15 deer each year. In Maine about 15 to 20 ungulates per year, a population of 100 wolves would take only 5-10% of those animals killed by human hunters.

"Collisions with motor vehicles (estimated 3,000-5,500 per year) would kill about twice as many deer in the state of Maine than a population of 100 wolves.

"The beaver population of Maine is estimated to be between 44,600 and 67,000. Of those, 10,000 are legally trapped. Maine's Department of Inland Fish and Wildlife Projective is to take 20,000 annually. Wolves could help here.

"The Environmental Impact Statement done for wolf reintroduction to Yellowstone estimated that the animal's presence would lure $23 million annually to that region.

"Clearly there is much to be said for the presence of wolves to the north-east and MWC's voice fits well into the chorus that is emerging to bring back the wolf.

"Glowa of MWC is very optimistic about his group's ability to work with the state agencies of Maine. Glowa has met with the Department of Inland Fisheries and Wildlife to explain what MWC would like to see done to facilitate the wolf's return: appoint a Maine Wolf recovery coordinator, develop a long term recovery plan, and create a data base to record possible wolf sightings. In addition both the MWC and the DIF&W are committed to working with the Province of Quebec as the state of Washington did with British Columbia. There, in deference to Washington's desire to allow wolves to recognize the state, the province closed areas to the taking of wolves to allow corridors of travel for the wolves to move southward.

"The Maine Wolf Coalition hopes to restore wolves by identifying and removing the barriers that now keep them from returning to Maine in numbers necessary for a viable breeding population. This is a patient approach that Glowa contends may take years if not decades.

"Michael Kellett of RESTORE: The North Woods is skeptical of the possibility of wolves returning to Maine on their own. He cites the physical barriers between known wolf habitat and Maine as too great for any numbers of the animals to overcome. "The St. Lawrence Seaway, a wide waterway that is never frozen, has met with the Department of Inland Fisheries and Wildlife to explain what MWC would like to see done to facilitate the wolf's return: appoint a Maine Wolf recovery coordinator, develop a long term recovery plan, and create a data base to record possible wolf sightings. In addition both the MWC and the DIF&W are committed to working with the Province of Quebec as the state of Washington did with British Columbia. There, in deference to Washington's desire to allow wolves to recognize the state, the province closed areas to the taking of wolves to allow corridors of travel for the wolves to move southward.

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For the moment wolf advocates have secured the cooperation of the Maine Department of Inland Fishery and Wildlife. This winter that state agency will send researchers into the Maine Woods to look for wolf tracks and sign, and to attempt to elicit responses from wolves by playing tape recorded howls. How long I&W remains involved in restoring the wolf depends largely on the findings of this winter's survey. If wolves are found in Maine, they could be added to the list of the state's endangered species that is due for its five year update this winter, and a recovery plan would be developed. If no evidence of wolves is found the state will likely lose interest in the project.

While state level action is crucial, Kellett warns that it is not the sole answer. State resources are limited and the restoration of the wolf to the northeast must be a regional campaign. Kellett sees MWC's work and his own (a two pronged approach that includes the reintroduction of wolves to Maine, and the establishment of a 3.2 million acre Maine Woods National Park to provide permanent habitat for wolves as well as all native species) as necessary aspects of a regional restoration plan.

The restoration of the wolf to the Northern Forest is a campaign that has excited thousands of people throughout the region. RESTORE has come nearly halfway to its goal of collecting 20,000 signatures to present to legislators to support a study of the feasibility of reintroducing wolves to their native range. New groups are forming to lend support; and at least one national conservation group, Defenders of Wildlife, is pledging to join the cause.

So why all the wolf hoopla? Because it is a diverse movement that represents a proactive approach to the restoration of an ecosystem. Some want the wolf back so that the Northern Forest ecosystem can regain balance with the return of its top predator. Some feel that it is our moral duty to restore a species that was locally annihilated by our ancestors. Some sense that wolves embody wilderness, and that their return to the Northern Forest would go a long way towards restoring the spirit of the wild to the region. Some look forward to the economic benefits wolves have brought to other areas of the country. Some look forward to the return of the wolf for all of the above reasons.

The challenge now is to form a regional coalition of all the voices speaking up for the return of the wolf. An alliance of hopefieled dedicated to bringing the wolf from our imaginations back into the forest. At a time when those who are fighting for the restoration of ecological health are being harangued by critics for overstating the problems of industrial society and for haranguing on negativism, the movement to restore the wolf represents one of a multitude of positive, visionary attempts to approach the restoration of ecosystems with the humility and reverence four billion years of evolution so deserves.

In the Fall 1994 issue of Garbage Bob Braille writes, "Americans are yearning for values, for moral and ethical vision, why is it that the best the environmental movement can offer is the obvious, 'We stand for clean air, land, and water?" He then asks, "... why is it that the environmentalists who are most in touch with the people—the grassroots environmentalists—are pulling away from the big national groups, thus fracturing the movement?"

The answer is simple, grassroots groups who support ideas such as carnivore restoration and the establishment of large ecological reserves have left most of the large national environmental groups in the dust. Environmentalism is not suffering from fracture and decay, rather it is thriving at the grassroots level by acting not within a rubric of perceived social and political reality, but within the realm of scientific reality. Those groups that have wobbled themselves to compromise and mitigation will not get the support from the public they have grown accustomed to receive. If the threats to biotic integrity are serious, then the solutions must be bold and honestly articulated to receive support from an increasingly anxious public.

And so the movement to restore the wolf (to even the minute fraction of its former range that is being considered) continues to grow. Whether it is the Maine Wolf Coalition knocking down the Big Bad Wolf myth through public education, or RESTORE: The North Woods pressuring the federal government to take this question seriously, there is room in the chorus for any voice that wants the wolf to regain balance in the forest it's right to roam the Northern Forest.

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Photo by George Wusthner

Winter Solstice 1994

The Northern Forest Forum

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Thinking Like a Watershed

Reflections on Forested Landscapes & How They Work

by Steve Perrin

Far more than sources of water, watersheds are also great basins where the raw ingredients of our forests are collected and mixed. In that sense, a watershed is a place where the dark world of soil, water, and roots meets the luminous world of sunlight, air, and leaves, the two being joined by the flow of sap in the stems of plants and trees.

The union in green leaves of water from the soil with carbon dioxide from the air allows the energy of sunlight to be captured and stored in plant sugars and starches, giving rise to woods and wildlife.

The flow of fiber from the land depends on the flow of water to the roots of forest trees. That flow is one continuous stream. Without the soil, water, and nutrients supplied to our forests by the watersheds in which they grow, there would be no forest products industry in the State of Maine: no mills, no jobs, no rural communities.

Ponds, streams, and fish are watershed products, along with wetlands, forest canopies, the stems of trees, shade, ground cover, seedlings, and both wildlife and fisheries. The flow of every sort of life depends on the flow of water through watershed soils. To make sure that flow continues without interruption requires us to think of forest practices, biodiversity reserves, hydroelectric dams, and development of rural areas in terms of their impact on the watersheds we share.

As a rule of thumb, that which promotes the long-term flow of native life under varying conditions is good for the region, that which stresses it beyond recovery is bad. Seeing human acts in a watershed context helps us evaluate their long-term effects. Resource extractors think in terms of what they can get out of a watershed; environmentalists think in terms of what goes into a watershed to make it work. The two perspectives are joined by the flow of soil, nutrients, and water through the land. It is to that flow we must look if we are to agree on a common vision for the Maine Woods and our Northern Forest as a whole.

The study of forests and wildlife is often broken down into the study of natural neighborhoods such as plant associations or communities. While such communities may stand apart in our minds, in nature they are seldom isolated from one another as if sprung from the soil by chance. Their placement is anything but arbitrary. Seeds and pollen may be spread by haphazard means, but they sprout where they do because of favorable on-site conditions, conditions influenced by other systems in the same locale. Viewing landscapes as mosaics made of "separate" pieces does an injustice to their underlying integrity, for which the flow of water through soil is primarily responsible.

Plant communities influence one another over time as well as space. Each site has a history which shapes it, prompting certain types of soils, determining which ions and minerals are available, supporting a canopy whose features vary in harmony with the seasons. Communities take their place in a line of communities interacting on a given site, forming a continuous succession stretching from life's introduction through further and further stages of its local development.

Seeing the natural world in terms of separate plant communities and uplands of trees invites us to fragment that world in our minds when, in fact, it is often better understood as a highly interactive landscape extending seamlessly through time and space. A landscape is made whole (healthy) by the connections between its parts. To understand why a certain community springs up on a particular site it is necessary to look at variations in the flow of essential resources joining that site to its natural surroundings.

The story of a watershed is told in terms of the continuous flow of water, soil, and nutrients from high ground to low across a given piece of terrain. That flow is governed by climate, gravity, and the lay of the land. They drive the watershed economy, fixing what resources are made available, where, when, and in what amounts, and, too, what plants have a chance to take hold should they appear on the scene, and ultimately, what microbes and insects, birds and fish, game and non-game wildlife species.

Instead of dividing our knowledge of the natural world into smaller and smaller pieces, the watershed-as-gradient concept knits our understanding of bits and pieces into a larger whole, stressing the continuity and integrity of the landscape, not its division into arbitrary parcels and fragments.

If a watershed is a natural division of the landscape that integrates intermittent precipitation into a steady flow of water and nutrients through the soil, what else does a watershed do? A number of things, including:

- intercepts precipitation over a wide area;
- stores frozen precipitation for release when plants need it most;
- directs water across the soil, through the soil, under the soil by the most direct route;
- gathers excess water in channels, lakes, and underground reservoirs;
- collects and distributes ions, minerals, and organic particles throughout its extent;
- makes photosynthesis possible in green plants;
- supports storage, growth, reproduction, repair, defense, and respiration in plants;
- supports motion, communication, and social behavior in animals, as well as the more basic processes;
- makes possible the distribution of food from producers to consumers to predators;
- supports the breakdown of organic materials;
- supports recycling of organic molecules;
- supports the breakdown of bedrock into a series of ever finer particles;
- harnesses erosion for the build-up of soils;
- redistributes soil components from areas of steeper to more gradual slopes.

Without a reliable flow of those basic resources, none of that would be possible.

In liquid form, water is guided in its descent towards sea level by the slope of the land. Steep slopes drain quickly; gentle slopes drain slowly. The character of every watershed is built on those simple facts. A watershed is a place where water intersects with actual terrain, its flow being governed by gravity, slope, soil, the network of available channels, vegetation, the amount of water held in the system, and the input arriving as precipitation. We think of water as running off a given slope, but that is often an inaccurate picture. Slopes are made up of porous, holding water in spaces between the solid materials they are made of. When rain falls, it fills those spaces, encouraging seepage lower down rather than run-off from above.

Water held within a slope picks up organic and inorganic materials from its contact with the land. Precipitation increases the availability of those materials in streams and ponds as nutrients for aquatic life. Water runs not so much over the land as through it, picking up nutrients, which seep in turn into streams whose life-giving character flows from headwaters where land and water have a strong interaction. Streams and lakes reflect the nature of their watersheds, their aquatic life depending on soils and vegetation upstream and upslope.

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Flowing freely, water picks up particles of minerals and organic matter, carrying them downward, depositing sediments and soils in areas of lower elevation and lesser slope. From ridge to valley, watershed soils are distributed along a gradient, from thin and coarse above, to deep and fine below, with richness of organic content increasing top-down, upland to lowland, windward ridge to alitvalle.

Erosion is a bad word when applied to the disruptive consequences of careless land use and development, but as the breaking of solid materials into finer and finer chunks and grains, together with their deposition downslope, erosion is not only natural but essential to the workings of watersheds. Gravity encourages mineral and organic materials to flow through a watershed, more slowly than water perhaps, but just as surely. As bedrock breaks down into smaller and smaller pieces, its surface area increases, providing greater contact with air and water, favoring the life they support. An ounce of typical soil contains roughly six acres of surface area promoting contact between air, nutrients, and water. Erosion also creates spaces between soil particles, spaces in which water becomes stored by adhering to grains of none-too-solid earth. Aquifers are underground lakes sharing space with porous soils and layers of fractured bedrock.

Watersheds are not only surfaces over which water runs downhill (or is "shed"), but three-dimensional volumes built up in layers, including layers of fractured bedrock, porous mineral soils, organic soils, fallen litter and dust, ground cover, shrubs, seedlings, saplings, and a variety of trees. Water flows through, and is stored in, every layer, holding precipitation for future use, maintaining a variety of moist environments in on, and above the earth, releasing water slowly to meet the needs of microbes, fungi, mosses, plants, and animate life from unseen worms and centipedes to those few charismatic species endowed to the human heart.

The lack of any watershed exists underground where water and soils interact. What we know of it is largely superficial, a matter of surface impressions. Some working parts of a watershed are hidden below ground. A watershed is also a "waterhold," a place where the flow is slowed or held back for use by local residents of all species. Gravity, slope, and precipitation drive its workings, but it is the innards of a watershed that deliver water to aquatic life in swamp, streams, and lakes, and to terrestrial life through roots in the earth at the right stage of the growing season, creating fertile conditions, releasing life's urge to reach toward the sun.

In his powerful essay, "Thinking like a Mountain," Aldo Leopold makes clear that managing a landscape for a single resource of benefit to a single species can lead to the unwitting ruin of that landscape itself. He gives the extirpation of wolves from deer country as an example. Wanting all deer for themselves, human hunters press government protection of wolves from deer country as an example. Wanting all deer for themselves, human hunters press government

Unless we can learn to think like a watershed, we have to ask ourselves whether we are qualified to intervene in its local affairs; whether we have any right to interrupt the distribution of water or soil, to extract resources, to disturb the pattern of the seasonal flow; whether we might not do more harm than good. To take a watershed's point of view requires us to see ourselves by a new light as mediators in processes we know little about. If we can't work with a watershed, we stand to work against it. No matter how noble or profitable our intentions from a human point of view, in serving our own aims we might well disrupt the integrity of the homeland we seek to improve.

Take the watershed of Card Brook, for example. Card Brook flows through the city of Biltworth, Maine, into the Union River estuary, its three branches draining a total of some six square miles (3,800 acres). A power line and an abandoned railroad cut through it, and its central lowland is surrounded by a ring of roads made up of sections of Main Street, High Street, Hancock Heights Road, and U.S. Route 1. The highest point in the watershed lies 300 feet above the tide line in the estuary. Annual rainfall is about forty-eight inches, depositing one-and-a-third million gallons of water on every acre each year supplying the watershed with a
total of some five billion gallons to work on an annual basis.

The eastern half of the watershed contains extensive glacial deposits of sand and gravel, bearing the largest aquifer in Hancock County. Originally wooded, these deposits are now heavily mined, the road looping through the watershed passes one gravel pit after another, each one farther north or south. Where the deposit isn’t mined it is forested, predominantly blueberry, or given over to industrial development such as sawmills, industrial storage depots, and maintenance lots.

A golf course cuts into the central swamp from Hancock Heights. The western half of the watershed is dominated by the city of Ellsworth and 50 years of strip development that has taken place along High Street and Route 1.

The center of the watershed within the road is a wetland featuring woods of tamarack, white cedar, and black spruce. The southern slope of the watershed is covered with spruce and fir fast giving way to masts and car dealerships.

The primary flow of water through the watershed of Card Brook runs from the sand and gravel aquifer toward the central swamp, and from there to the brook. The Trinity angler needs patience when waiting slowly, feeding swamp and brook in the driest of seasons. The brook itself is famous for trout, or at least it used to be. The fishing is not as good as it was. Human land use and development are having an impact on the natural workings of Card Brook. Every cubic yard of gravel removed from the pits reduces the storage capacity of the glacial deposits, decreasing the flow through the swamp. Herbicides, pesticides, and fertilizers sprayed on the fields and lawns of neighboring field sets the aquifer, and eventually flow into wetland and brook. The Town of Hancock designated the Washington Junction area on top of the aquifer as an industrial area meant to serve greater Ellsworth, a role it has served for over a hundred years, creating a pollution hazard which destroys the aquifer’s value as a public water supply.

The story of Card Brook tells what typically happens to “junk land” seen as having little or no value. Eventually the gravel will be removed (as it was on the site now serving as the local airport), leaving the aquifer diminished or depleted as a natural reservoir of clean water. The central wetland will dry up, and developers will discover thousands of acres of buildable land within a stone’s throw of Route 1. The tamaracks and cedars will be cut, the land subdivided and built up. In a hundred years Card Brook will no longer exist; its watershed has taken over for municipal use to temporarily ease the pressures of population growth and urban sprawl.

The story of Jordan Pond watershed on Mount Desert Island in Maine has a happier (that is, more sustainable) ending. George Dorr, founder of Acadia National Park, wrote in 1911 enabling the watersheds of Eagle Lake and Jordan Pond to be taken “for public purposes by eminent domain” in order “to protect the waters thereof from pollution.”

Today these watersheds are largely given to recreational use, managed by the National Park Service for the twin objectives of resource protection and public enjoyment. Both watersheds are covered with mixed stands of deciduous and evergreen trees and feature ponds of renown purity.

In the Jordan Pond watershed, a single structure (a seasonal restaurant) stands on its southernmost edge. The pond itself serves as the public water supply for the local community. Aside from that, human development is restricted to one automobile road, a gravelled carriage road, and an extensive network of hiking trails. Under two square miles in area, the watershed contains 1,200 acres, receiving in an average year nearly one-and-a-half billion gallons of rainfall. The long axis of the watershed points south-southeast, so it receives ample sunlight. Its slopes are rocky and steep on both sides of the valley, rising 1,106 feet above pond level to the summit of Sargent Mountain on the west, and 974 feet to Pemetic Mountain on the east. Other prominent features include North and South Bubble, Penobscot Mountain, and Jordan Ridge. Soils are thin and subject to erosion, consisting of unconsolidated glacial deposits in low areas, exposed ledges of granite on the upper slopes, with extensive talus slopes at the base of steep cliffs. The sun is above the horizons for nine hours at the beginning of winter, fifteen hours at the beginning of summer. Annual snowfall measures on average sixty-eight inches. Such are the bare facts and statistics.

One look at the valley of Jordan Pond (from the edge of the pond, say, or the summit of North Bubble) reveals something else: the entire watershed is alive. Vegetation covers all but its steepest slopes, and a closer look shows them to be decked with lichens, mosses, and ferns. At a glance the watershed appears as a basin of life which directs water through the soil when it comes from under a stone. Where a fox inspected a tuft of grass; here a red squirrel bounded tree to tree; here a fox inspected a tuft of grass; here a mouse came from under a stone. In every season a variety of birds use the updraft over the cliffs as a highway through the sky. And anglers know what life lurks in the depths of the pond 150 feet down.

Thousands of people visit the watersheds of Jordan Pond through the seasons, arriving by car or bus, but going on by bicycle, boat or canoe, boatedrawn carriage, snowshoes, cross-country ski, snowmobile, or more likely on foot. They come to celebrate the watershed, and to enjoy the values enhanced by its protection. Here they find nature in good working order, a rare experience for many of them. People have a place in this setting, but beyond a restaurant and parking lot, they do not dominate the scene.

When studying a particular watershed, we need to know:

* the watershed’s size, including its length, breadth, and area;
* the nature of its terrain, including low-est and highest elevations, steepness of slope, and something of the local geology;
* the amount of precipitation falling on it monthly and yearly, including rain-fall and annual snowpack;
* how much water is carried by its streams, and the volume of water stored in its ponds;
* the idea of the local climate, including average and extreme temperatures, wind direction, and the direction the watershed faces (its aspect);
* length of growing season;
* description of soils in different parts;
* types of vegetation supported by those soils;
* animals supported by that vegetation, including insects, fish, amphibians, birds, and mammals.

Above all, we want to understand how water and soil flow through, and are held by, the valley at each season, giving us a feel for water balance and well-being through the year and the year.

Against that background of factual information, our scenic appreciation of a given watershed is enhanced. We approach it as an active, living being in its own right, whose appearance tells a great deal about the shape it is in. Scenic beauty reflects natural processes are healthy and in good working order. Unattractive ones are not. We know that intuitively without having to be told. Anyone who has walked through a cloestaur area where a forest has recently been felled knows she is following in the tracks of a mechanized disaster. The last of the red spruce and fir, white cedar and gray, soil is exposed to wind and sun, water has risen out of the ground to flood low-lying areas, and the overall impression is that something has been destroyed. Recovery will take a hundred years, and even then there will be impairment due to lost soil and lost life.

The great advantage to be had from taking up the watershed perspective is that it works. It took me less than three years to learn how to think like a watershed. During that time I was living on an island of thirty-two acres in an estuary on the coast of Maine. I began by thinking about water...
Blow down in every storm, upended networks of roots showing how tenacious their grip had been, how wide they had spread to find water in the shallow earth. I lived in those island woods long enough to experience the difference between easy winters and hard ones, short ones and interminable ones, warm ones and cold ones. I began to understand how the seasonal climate affects islanders of every sort, sometimes benefi-
cently, sometimes adversely.

I saw evergreens die from drought both winter and summer, voles driven from their grassy tunnels by floods, white hares betrayed by fickle snows that never came—and brown ones by snows that stuck till May. It was the best education I ever got. For two-and-a-half years I watched the natural world at work, slowly developing a feel for life's dependence on water, a fact I had long taken for granted, but never fully appreciated.

The ground is hard in winter because it's frozen. Everyone in New England knows that. What I hadn't thought about before was that it's not the ground or soil itself that freezes, but the water it contains. That simple realization brought home the fact that there's water in the soil all the time, though it largely escapes my notice. I began to connect those great knobs of ice along the shore to the flow of water through the soil—one of the great discoveries of my life.

Then there was spring! How slowly it comes to the coast of Maine! Winter doesn't retreat all at once, but stalls off in a series of transitional stages. First comes ice season, then slush season, followed in turn by mud season, mud season, and mud season (also known as pothole season). If you want dramatic evidence of how much water is held in the soil, watch Maine from mid-March to early May when the ground turns from white, to gray, to brown soup. That is when all the moisture locked as snow and ice through the winter is released, flooding the land, rooting watersheds from their frozen slumber.

Streams swell, rivers overflow, icy ponds break up, channeling excess water toward the ocean. But that is just the thawing tip of the underground iceberg. Most water is retained by the soil, which softens as the temperature rises, inviting roots to drink up once again. While they do slowly at first, then in great swigs and gulps, carrying water to thirsty buds, providing a fluid environment in which cells can divide and new growth emerge.

Experiencing these changes on the island, I came to see how the flow of water in plants was connected to the flow of water on the land, and how the miracle of life depended on both. What is growth but the streaming expansion of cells into unclaimed territory? Water is the medium of supply to plants, and nature, allowing it to swell, increase, expand—advance—that is, to grow. Without that watery medium, life could not spring from the earth and spread its branches toward the sun.

Watching buds swell day-to-day, I saw how plants flowed into space, reaching into their surroundings by way of ever-lengthening vessels and stems. Not only do watersheds supply water to full-grown plants, but they help those plants get a start in the first place by assisting at their birth. Without ample water in the right place at the right season, none of that would happen.

Plants—all plants—are outward and visible signs of the dampness and waterborne nutrients available to their roots and other absorptive tissues. That dampness and the nutrients it carries depend, in turn, on the storage capacity of the soil, and the replenishment of the local supply from sources upslope. Once I understood the seasonal and three-dimensional structure of the island as a water distribution system, I began to understand watersheds in terms of the water they make available across time and space to a variety of species having different appetites and tolerances.

Watching hundreds of spruce seedlings die, and the needles of a mature white spruce turn brown and fall off in July after a month-and-a-half without rain, I realized they had drained every drop of available water from the soil and had all died of thirst. In the same drought-moosened curled their green tissues in upon themselves, exposing a tough brown underlayer which helped preserve what little moisture was available from fog and dew. When it finally did rain in late August, they unfurled their tender parts and seemed to shine with an inner green glow.

Fall is a generous season on the island, plants dropping their leaves within a matter of weeks, adding organic matter to the duff, adding the causes of soil formation and water retention, contributing to the welfare of coming generations.

I still carry the watershed perspective I won by opening my senses to life on that island, applying it daily to new surroundings, developing it, trusting it to lead me nearer and nearer to the truth of life on island earth. It is not true that people are the be-all and end-all of all creatures. We rose from others, among others, casting our lot with other species of the ultimate gift to which we ourselves have, if not the obligation, certainly the opportunity of being true.

Steve Perrin writes about water from the Maine Coast. This essay is adapted from a collection titled "Watershed File" available from the author at: Watersheds Are Us, POB 583, Bar Harbor, ME 04609-0585.
Conte National Wildlife Refuge: Ecosystem Management in the Connecticut River Valley

by Andrea Whitaker

Today, the Connecticut River valley protects over 14,000 acres of its cultural phases: native, agrarian, industrial and exurban. The survival and restoration of its natural heritage, which must occur amidst this complexity, has a new ally in the US Fish and Wildlife Service, the agency in charge of the Silvio Conte National Fish & Wildlife Refuge established by Congress and currently in its planning stages.

The Conte Act charges the F&W&S with the responsibility to "conserve, protect and enhance" specified wildlife populations—Atlantic salmon and bald eagles, for instance—and the entire ecosystem upon which all the Connecticut watershed's plant, fish and wildlife depend.

As part of project planning, and in response to some negative opinions expressed toward the Refuge in public hearings, the F&W&S last spring held four weekend-long retreats to which they invited Valley stakeholders of all stripes: landowners, conservationists, planners and politicians.

Its mandate in the Connecticut River watershed brings the F&W&S into the wider realm of ecosystem management. However, more a traditional role of establishing and managing wildlife refuges with the goal of protecting specific habitats and species, the layering of jurisdictions is in achieving protection goals outside of traditional refuges, across an entire landscape, will provide a model for other parts of the nation. The layering at last spring's retreats worked toward consensus on how the F&W&S can achieve its goals in the context of current land use.

Up & Downriver—Economy Meets Ecology

In general, economic concerns and the protection of property rights were more common themes in the two more northerly sessions (Fairlee, VT and Franconia, NH), while participants in Massachusetts and Connecticut focused more intensely on conservation and protection from development. Nonetheless, all sessions, with differing points of emphasis, identified landowners and traditional agricultural and forest uses of the land as key components of any conservation strategy.

The differing focus and fears perhaps reflect what Molly Beattie, Director of the USF&W&S, refers to as the "northernmost session, in Cromwell, CT, which proposed the Refuge take on wide jurisdiction, embracing the entire water shed and not merely the immediate Valley, also expressed concern that conservation mandates be flexible enough to adjust to specific needs of each River region.

The Cromwell session, in common with the other's, centered on the refinement of the traditional land-based economy as a fundamental approach to conservation. Specifically, participants recognized the need for some preservation of the traditional land-based economy as a fundamental approach to conservation. Specifically, participants recognized the need for some preservation of the traditional land-based economy as a fundamental approach to conservation.

However, while participants in Franconia envisioned the Refuge becoming part of the region's economic landscape. If visitors were granted access to the Refuge by purchasing a user's permit, for instance, funds generated could be funneled back to communities and landowners participating in the preservation of Valley habitat.

The feeling in Franconia was that consensus is a process, not a final product, and that there is as much need, if not greater, for discussion and debate to occur at the grassroots as in Washington, if genuine solutions to real environmental conflict are to emerge.

For the Refuge to build on local consensus, the F&W&S must be at the very least a listening participant in local dialogue.

Federalism at the Grassroots

Will the Refuge work? As a participant at the headwaters session, where some contentiousness was expected, a grass-roots advisory council for the Refuge, composed of citizens representing all stakeholders in the Valley (specifically, the preservation of Valley habitat, which lies outside the Refuge's purview but certainly underlying many of the concerns expressed, was the acknowledgment of economic difficulties faced by resource-dependent economies. Effective conservation will have to direct the flow of economic resources to environmental initiatives in agriculture and forestry.

Education Centers & Watershed Councils

Other recurring themes that the F&W&S will see in the Valley, included participants could be funneled back to communities and landowners participating in the preservation of Valley habitat.

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Forestry Liquidation in Whitefield, NH continues. This photo was taken in October 1994, six months after Jim Wemyss, Jr. sold them to local forest liquidator, Ted Ingerson whose mechanized equipment is capable of clearcutting four acres a day. The 1800 acre tract is adjacent to wetlands, and it is in the Connecticut River Valley.

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management is on-site evaluation and making a plan for landowners—perhaps by fielding a Youth Conservation Corps trained for the task. Second, do the Tree Farmer and other publications that take advertising dollars from American Cyanamid and other pesticide producers argue in entirely good faith? There is a strong positive correlation between negative editorial stance toward wetlands regulations and pesticide advertisement. Such journals often will tell farmers and landowners that their property rights are an absolute. To me, with only a layman's appreciation for the law, absolute right confers absolute liability. Are users of pesticide willing to assume absolute liability for its use? (Note: last spring Monsanto sent me a newsletter sharing the news that, with swifter testing procedures, they can reach a greater magnitude of chemicals on the market—read: environment—something on the order of 100,000 a year.)

A dialogue must occur at the grassroots: what are agriculture and forestry's roles in the environment to be? Most fundamentally, those who grow our food and harvest our timber and otherwise deal directly with the environment must use government initiatives such as the Conite Refuge to present consumers with the choices our economy creates. We can have cheap food and salinized soils, pesticides and endangered species, or, we can devote ourselves to the task of creating an ecologically self-regulating agriculture.

Participants in the Refuge planning process have effectively presented the landowner and producer's points of view and placed farmers, foresters and other landowners at the center of Refuge progress. We at a society can have a local means of food production, and the fruits of a truly rural economy that acts as arbitrator between human and natural environments—but only if the wider populace can recognize and be willing to pay for the benefits. For their part, landowners must be willing to respond to greater regulatory flexibility and economic changes by heightening their level of stewardship.

As it is, the public supports conservation initiatives, values regulations that ensure environmental quality and food product safety, and in fact the true source of many of the regulations of which landowners complain. Will consumers pay a higher price for systems of farming and forestry that don't merely safeguard human health but also actively preserve an ecosystem such as the Connecticut's for the Atlantic salmon, black bear, osprey or salamanter? In other words, will the public accept the internalized cost of stewardship in the prices they pay for staple goods?

The answer is as clear as we choose to make it. Education, as Conte planners (and others involved in the Northern Forest Lands dialogue as well) agree, is critical. Maintaining the viability of farming and forestry at a small scale is essential. Refuge expertise must supply local planning officials and landowners of the region the resource inventories and comprehensive information they need to act in concert with regional conservation goals. The interior workings of this process must be as visible to the public as the landscape it protects: once seen and understood, the public will understand the choices they must make as well.

The essence of a New Deal here is a bargaining table agreement: agriculture and forestry will protect the natural ecosystem in which they operate; wider society will re-direct our economy toward rewarding ecological means of production. The Fish & Wildlife Service can fulfill its mandate to protect and restore the Connecticut Valley ecosys tem and act from the spirit of its planning sessions, by acting as catalyst for this vision.


New Hampshire and Vermont have issued the results of their first joint water quality assessment of the Connecticut River watershed. The report on the Ohio River tributaries submitted by a federal EPA Clean Water Act grant and further charged by the two-state Joint River Commissions to answer basic water quality questions, the study was conducted by Vermont's Basin Commission, Department of Environmental Conservation and New Hampshire's Department of Environmental Services in 1992 and 1993. The joint effort provides a basis for further coordination of water quality protection plans, dam relicensing procedures and common testing priorities.

The study sought to answer eight questions about water quality in the Connecticut River watershed. Are river and watershed waters drinkable, safe for swimming and the fish safe for eating? Do dams contribute to water quality problems? Is there healthy aquatic life in the river? Can the river's waters absorb more treated waste, on the one hand, and offer a source of water for agriculture and forestry at a small scale is essential. Refuge expertise must supply local planning officials and landowners of the region the resource inventories and comprehensive information they need to act in concert with regional conservation goals. The interior workings of this process must be as visible to the public as the landscape it protects: once seen and understood, the public will understand the choices they must make as well.

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**Winter Solstice 1994**

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**The Northern Forest Forum**

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by Andrew Whittaker

Nostalgia for the '70s????? Society as filtered through the blandness of Time or Newsweek insists on the late counterculture's essential hedonism, as recently re-played at Woodstock. The '70s, to light on that, were a time when hip-ness came to a head, also of food-related innovations in agriculture, diet and marketing. Witness the health food store, farmers' markets, organics and interest in whole-grained vegetarianism.

The personal being political, many who tuned in and turned on to cultural reformation saw the most effective means of revolution as a new relationship with food. Given the steady institutionalization of organic agriculture, food co-ops and healthier diet, this may indeed be the '70s' greatest legacy. Whether we thank the hippies or look to the straight arrows who preceded them (the Rodales, Rachel Carson, Wendell Berry) or any number of other dissenters from the chemical agriculture that gained vigor after World War II), the '70s were a time when the focus on the Big Issues that dog us still promised quick and fundamental change.

In retrospect, we in the US took the political course that, for instance, Hazel Henderson feared we might: a migration from troubles in a politics of avoidance and fiction. That the debt left from this emphasis the need for a Food Policy, an economic interests.

Old Toryism & New Tribalism

Now, even as we have a White House that is reportedly interested in the Atlantic Monthly's ongoing coverage of what might be termed the new world disorder—national governments themselves breaking down under population, ethnic and resource-depletion pressures—the belief continues unabated that solutions to local problems can be provided by building a stronger global economy.

The focus on agriculture thereby remains one of keeping farming alive in the face of huge surpluses—we shall export them—merging a whisper that surplus producing agriculture causes the decay of rural communities. Surpluses undercut farm profit, invite the substitution of capital for (family) labor as pro-developers of a new economy of scale and encourage the destruction of a conservation-oriented agriculture.

Martha Lewis, writing in The New England Farmer has observed the trend in the industry toward big monopolies and more centralized control of food production (and prices). Although not explicitly encouraged by this, he does note that it makes the small, traditional farmer's best strategy to specialize, develop marketing niche and, above all, remain debt free (ie, free from the vagaries of short-sighted macro-economics).

The insight of the '70s that has fueled the faith of those in the field pursuing a sustainable agriculture is that present modes of production are not tenable, either thermodynamically or socially. (English literature has been documenting the ravages of industrial and commercial agriculture since the Enclosure Acts broke traditional social bonds in the English countryside. Urbanization and attendant alienation, as we now call loneliness, dominate art and literature of the 19th and early 20th centuries. Science and technology have triumphed culturally today that little other social context exists from which to base observation or sensibility. Is this why music, the most Dionysian of art forms, is ascendant?)

To avoid a foreign policy absolutely subservient to domestic energy needs, the US must re-fashion agriculture—both as the incredible energy waster it is (counting all food production and distribution), and as the catalyst to rural health it could be. Environmentalists of the new tribalist school only stir the pot further, with the often (seemingly glib) observation that society must evolve toward a hunting-gathering state. Their critique of humanity indicts the post-glacial agricultural revolution for destruction at its seat, Mesopotamia, and on in the path of the great empires: Greek, Roman, and British.

The simple prerties of agriculturists, stretching back in our own culture to European "high farming" of the Middle Ages, are adequate to the task of reforming agriculture. More is needed than legumes and manure to accomplish agriculture that will feed the world but also allow our natural ecosystems to perpetuate themselves.

Permaculture

Permaculturists are agriculture practitioners for whom the principle of intensified production and design will achieve the goal of sustainability. Scan a text of Bill Mollison's, one of the premier permaculturists, and you will find among his many practical guidelines and ideas the ethical cornerstone of permaculture. Man must stay out of the bush, all remaining natural forests must be protected in their existing state, we must intensify the functioning of our homesteads so that wilderness can remain to the species requiring it—humans included, as Mollison makes note of the milieu from which we sprung.

And even beyond that: nature itself is the proper model for our farming and gardening. Fundamentally, permaculture is ecosystem design on a micro-level. The key to efficiency is intensive design creating an ecology of farm and garden components including human labor, tree and other perennial crops, animals and local energy systems. Land and resources should be liberated by such intensification and left to go as they will.

Before his untimely death while on a mission to bring his non-chemical, non-industrial vision for agriculture to Russia, Robert Rodale mused in an editorial (in his Organic Gardening magazine) on the role of humans in the next economy. He was troubled by predictions that robotic labor would be displacing humans. Rodale, ever the moderate, arrived at the conclusion that humans desire service (especially information) in their economy. Agriculture would retain a need for humans because only humans, he reasoned, can provide high levels of service, as in a garden-based agriculture.

Mollison and other permaculturists carry this idea further (while also rejecting the hyper-tech model that Rodale accepted as inevitable). Human labor as they see it is not just socially but thermodynamically necessary; more people must orient themselves to provisioning their own needs because the biosphere's health requires we shift out of massive energy consumption. The alternative—an agriculture and wider society based on Big Energy—will require increasing}

ly untenable social policies (war, expensive investments) as well as ruinous ecological demands (pesticides, dams, radioactive waste). The key is that human inventiveness, emulating nature, creates farm ecology.

Perhaps permaculture's most intriguing aspect is its de facto decentralization of research and science. Every microsite requires its own evolvement and development, based on observation of the natural forces existing there. (Human governance will evolve in the same way, by locality, within watersheds.) The instant solution of herbicide is absent in permaculture. Indeed, permaculture views the neat and tidy appearance of monocrop culture as chief symptom of the chaotic inefficiencies our agriculture imposes on the environment.

Conclusion

The Connecticut River Valley is ages away from perma(nent) (agriculture). But, with the food-ferment of the '70s having brought a fresh wave of innovation here in the form of low input, value-added and organic agriculture, we've taken first steps.

The role the river plays, the role it has played, is that of a transcendent wisdom we can return to, despite several centuries' neglect and desecration. It occurred to me once this summer as I hooed my celery (like the Romans) many miles upriver from Long Island Sound, yet wishing for a load of eelgrass to add to my sandy terrace soil. After all, isn't it just right the ocean may make some return of nutrient for all the sediments we dump in it?

Then, of course, I recalled that once upon a time, with the salmon and shad running each spring, Nature of its own accord made that return—and much more artfully than with a truckload of seaweed puttering along blacktop. Native peoples of the Connecticut Valley had the humility and insight to base their culture, fertilizing their crops and feeding themselves, on that return. Maybe someday we will too.
The editors conclude that forest

The current ownership and management patterns have served the people and forests of the region well.
Clear-Cut Action Needed

Ed Note: The following, abridged from an editorial of the Rutland Daily Herald, October 12, 1994 is reprinted by permission. It is disappointing to note that none of the papers that cover Vermont's natural resources, including our forests, ought to be used in such a clear-cut manner. The incredible destruction of our forests. See back cover for a map of Lunenburg Vt clearcuts.

More information is emerging about the extent of logging operations underway in the Northeast Kingdom, and it is time the government recognizes the potential dangers to the economy and the environment of heedless and widespread clear-cutting.

Could the logging in the Northeast Kingdom be called heedless? Nobody knows for sure because nobody keeps track in a systematic way. But according to those who have driven through, flown over and taken a look, huge swaths of land are being deforested.

A recent study has found that a quarter of the entire land area of the town of Concord has been clear-cut since the early 1980s. In some places thousand-acre parcels are being stripped bare.

A thriving timber industry is also important for the economic health of the Northeast Kingdom, where unemployment is high. Vermont's natural resources, especially its forests, ought to be used in such a way that they support our economy and strengthen the rural way of life that Vermonters cherish.

But when the clear-cutting of forests reaches a certain magnitude, all of this changes. When a vast expanse of forest is laid bare, regeneration of high-quality timber is much more difficult, foresters say. In the meantime, erosion can ruin the land and waters of the region, and wildlife habitat will have been destroyed.

Rapid deforestation also sets up the region for a dangerous boom-and-bust cycle that, in the long run, could do considerable damage to the economy. The unemployment that has plagued the timber industry in the Pacific Northwest is only partly due to the spotted owl or proposed species. Rapid removal of the forest resource has brought the timber industry there closer than a lot of loggers might wish to deal with state officials.

If short-term economic gain were the desired goal, Vermont could strip itself bare as it did in the 19th century and then wait amid the puckerbrush for the falling and no one is hearing. The government representative on the Northern Forest Commission who had also applied for an Act 250 permit to subdivide one of several abutting parcels in the purchase. This parcel also abuts Camel's Hump State Forest, whose protection was a significant reason for the continuation on page 31.
More Tree Talk: The People, Politics, and Economics of Timber

by Ray Raphael
Island Prent 1994

For those interested in the debate over forest policy in this country, More Tree Talk: The People, Politics, and Economics of Timber by Ray Raphael is a must read. The book is important not only because of its readability and breadth, but also because Raphael lets much of the discussion come directly out of the mouths of those who have worked intimately with the forests of the Northwest, rather than solely through his interpretations.

Raphael uses this monologue technique to introduce us to the history of logging in the northwest, the logging industry, and industrial forestry, and critiques of industrial forestry. He has his protagonists discuss their experiences. Dr. Rudolph Becking, a forestry professor emeritus at Humboldt State University, for example talks about how the Swiss all-aged management system evolved, and how it has worked for generations in a culture where forest stewardship is ingrained.

The industrial model, based on large roads, heavy equipment, clearcut logging on steep slopes, clearcuts in the Northeast Kingdom, this is disruptive of life processes (such as the role of fungi), and leads to stand-disruptible to insect, fire, and disease problems. It also is causing devastating effects on local communities as people are replaced with machines, wood runs out, or cutting is halted due to threatened endangered species.

While he is no fan of industrial clearcuts, he has reservations about widespread reliance on selection due to problems (sometimes connected with abuse) such as excessive roads, logging to damage to residuals and regeneration, and damage to root systems from heavy equipment. For him, holistic forestry would use the method (clearcut, shelterwood, or selection) most appropriate to a given site and to the landscape.

He is equally skeptical of industrial ownership of timberland. Because the companies are concerned with maximizing returns on their investments in a world of discount rates and competing investments, they end up, ironically, lowering forest productivity by cutting trees well before biological maturity. Due to the insidious effects of interest rates pitted against tree growth, "Private enterprise," he writes, "operating according to economic necessity, is simply not suited to the job of producing the most and best timber products."

Some of the more interesting sections of the book are the those where practitioners of more benign forms of forestry discuss their experiences. Dr. Raphael comments afterward, "The Swiss system is, in a word, personalized. The foresters and forest workers are dealing with individual trees on limited forest land, not with large, anonymous tracts of raw timber. There is no financial reward for liquidating resources; indeed, the professional standards are based on how well regeneration can be accomplished. The forest is seen as a complete entity that grows timber, nourishes wildlife, stabilizes hillsides, provides water, and serves the recreational needs of human beings. The forester is the caretaker—but not the owner—of this entity. He is a ‘ranger’ in the old-fashioned sense: a keeper of the woods, a steward of the land. As a public servant and an elected official, he is charged with the task of maintaining a healthy, balanced, and productive forest."

To Raphael, such a system is a living example of holistic forestry.

Cut & Run
Continued from page 30

denial of the application. The legal questions of whether this should bring the logging on all contiguous tracts under Act 250 review has not yet been resolved. [Ed. Note: In late November, the state joined the Vermont Natural Resources Council in calling for an Act 250 review.]

Perhaps more significant, town roads have a 24,000 pound weight limit, which requires a special overweight permit to allow heavier logging tracks to use them. This could provide the towns leverage to set some conditions on logging practices.

Remedies Needed

Despite their vehement disapproval of the logging plan, both Motyka and Lafferriere opposed state regulation of forestry. Advocates of voluntary training, they have no answer for the problems posed by an operator who will be gone in four years, or for a timber purchaser from Canada, without any long-term interest in Vermont forests. The growing outcry against massive clearcutting, as it spreads across the Kingdom, as this example of avoidance of the land gains tax, and the instance in southern Vermont several years ago, wherein a deer yard protected from destruction by denial of an act 250 permit was subsequently clearcut without any legal record, is at least proof that the need for stronger laws to preserve sustainable forestry and protect habitat.

Voluntary cooperation is the most desirable course, but clearly it doesn't work when owners have no long-range stake in the land. Highgrading and clearcutting are an unsustainable tradition that has degraded Vermont's forests for too long, and the public will not accept them any longer. As the NFLC should have learned from its listening sessions, the public is demanding reform, and will seek new ways to enforce that reform.

One proposal would empower individual communities to set standards for silvicultural practices under their zoning authority. The varying provisions of individual codes set by each municipality, together with the difficulties of determining which town's code applies at a particular spot in the woods, where boundaries may be unclear, makes this idea appear very inefficient. The costs of trained personnel to assure compliance would be an added inefficiency. Also, provision of forestry rules under zoning powers would seem more likely to keep zoning board agendas full with variance requests rather than to accomplish real conservation and sustainability objectives.

One of Commissioner Motyka's principal objections to being assigned a forestry enforcement role was fear of the effect upon the department's budget and its other programs. Funds for a forest practices program could, however, be raised by a severance tax on timber harvest that replaced, at least in part, the property tax burden that timber owners currently complain about. Such a severance tax, currently in use in New Hampshire, could be scaled to the intensity of the logging, and might also help make up for the land gains tax that is being avoided in the Mad River Valley. Certainly it makes tax costs more nearly concurrent with income from forestry, answering a problem that some claim is a reason for poor forest practices.

There are many possible ways to deal with silvicultural malpractice, a problem which the public has recognized and for which it demands a response; the one unacceptable course is further delay and inaction from the state. Voters will have to make that very clear to their representatives and the Governor as the Legislature convenes.

Lowell Krassner of South Burlington is a longtime grassroots activist with the Sierra Club.

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Vermonters
Your Government Refuses to Stop Forest Liquidation!

*Over 18 Percent of Lunenburg has been clearcut since 1980*

And Still the State Assures Us That Voluntary Forestry Guidelines Will Protect the State's Forests

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Town of LUNENBURG, Vermont
Recent Clear Cuts 1980-1994

- **Clearcut Areas 1980-1994**
- **Remaining Forest Area**
- **Lakes & Ponds**

Map produced by Vermont Natural Resources Council & Northeastern Vermont Development Association

Property Rights Zealot & Forest Liquidator Keith Van Buskirk Plans to Highgrade 9000 Acres in Fayston and Duxbury
(See Article on Page 30)

And Still the State Opposes Regulations Designed to Halt Forest Liquidation

Write Governor Howard Dean, State House, Montpelier, VT 05602 and Demand that the State Stop Forest Liquidation Now