Forest Conservation and Stewardship in Massachusetts

Charles H. W. Foster
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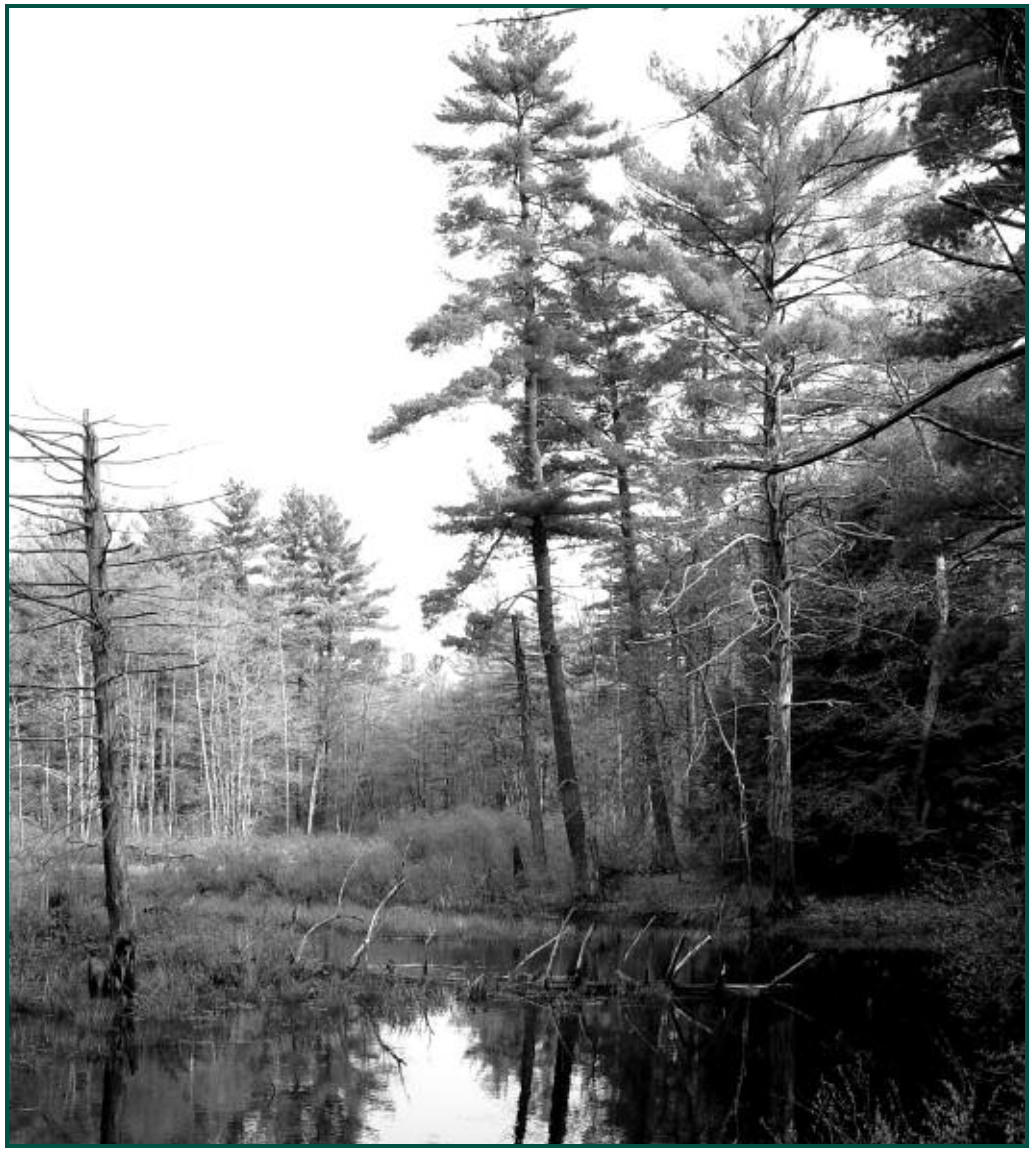
Perry R. Hagenstein
Editors



FOSTER & HAGENSTEIN FOREST CONSERVATION AND STEWARDSHIP IN MASSACHUSETTS HARVARD FOREST

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Front cover photograph: Edge of Harvard Pond. Photo by David R. Foster.
Back cover photographs: Forest activities as presented in the Harvard Forest Dioramas, Harvard Forest, Petersham, Massachusetts.

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FOREST CONSERVATION AND STEWARDSHIP IN MASSACHUSETTS

Charles H. W. Foster, Perry R. Hagenstein, and David R. Foster

EXECUTIVE SUMMARY

A team of nine forest specialists, convened with the assistance of the New England Natural Resources Center and the Harvard Forest under a $15,000 research grant from the U.S. Forest Service, has recommended that Massachusetts move promptly to institute a new element of its state forest and park system dedicated to the conservation and stewardship of the Commonwealth's three million acres of forest land.

Unlike other state forests, the stewardship forests would include private as well as public lands protected from development by conservation restrictions and fee ownership and would be managed collaboratively. Among their unique features, the areas would encompass whole ecological, hydrological, scenic, recreational and cultural systems, would provide for direct involvement by landowners in their governance and management, and would offer extensive opportunity for educational outreach to landowners.

A potential pilot for the new system would be an area of at least 100,000 acres of mixed ownership on the Berkshire Plateau of western Massachusetts

The Massachusetts forestry team visualizes significant support for the initiative from state sources and existing Forest Service and other federal programs. This effort could serve as a first step nationally toward better addressing the needs of the nation's 500 million acres of non-federal forest land.

INTRODUCTION

This report summarizes the findings and recommendations of a team of forest conservation experts (see Appendix A), convened with the assistance of a Forest Service research grant, to explore ways to advance forest conservation and stewardship in Massachusetts. The team included two former members of the National Research Council's study committee on the nation's non-federal forests, three individuals with lengthy experience in state forest policy, and nationally-known specialists in applied history, participatory governance, public-private partnerships, and forest protection, management, and ecology. The findings and recommendations are based upon a series of working papers and two discussion sessions convened at the Harvard Forest in Petersham, Massachusetts.

This report was triggered by three events. First, a new Massachusetts (Romney) administration entered office in 2002 committed to advancing conservation and development synergistically through a new Office of Commonwealth Development. Second, the cabinet-level Environmental Affairs leadership is interested in exploring a substantive role for the Forest Service in forest conservation and stewardship as Massachusetts is currently one of only eight states without a national forest located within its boundaries. And third, though the Massachusetts forest has recovered to a new historic peak in area and condition it is greatly threatened by development and the lack of long-term and broad-scale plans for conservation.

In May of 2003, Charles H. W. Foster of Harvard's John F. Kennedy School of Government and David R. Foster, Director of the Harvard Forest, obtained a $15,000 grant from the USDA's Northeastern Forest Experiment Station to support a summer-long, preliminary inquiry of prospects for forest conservation. By June of 2003, a team of nine experts had been assembled and began preparing this report.

Midway in its investigation, the team was advised of a draft conceptual model of a new kind of national forest circulating within the Executive Office of Environmental Affairs (EOEA). This was to be based upon conserving forests through easements rather than fee purchases. The result would be a national forest with little or no direct federal ownership. The team also learned of a new Forest Legacy District, to be designated by the U.S. Forest Service, covering a two-county, 600 square mile area in western Massachusetts. Elsewhere in the Northeast, the news of a proposed Congressionally authorized national stewardship area for the heavily forested Highlands Region of New York and New Jersey was an indication that Massachusetts's aspirations were shared by others.

The scope of the inquiry was later defined to examine opportunities for area-wide, cooperative, participant-governed, and government-assisted forms of forest conservation — elements that can be summarized as follows:

> By area-wide, we mean an approach that bridges ownerships and political boundaries, incorporates diverse values, and exercises forest stewardship in ways consistent with natural conditions. The focus is on landscapes of ecological integrity and human value.
>
> By cooperative, we mean actions determined and taken by those directly affected — bottom up rather than top down — with provision for the cooperators' direct participation in both program execution and governance.
>
> By government-assisted, we have in mind actions facilitated through voluntary programs of education, technical services and financial assistance offered by local, state or federal agencies. We perceive the governmental role as that of an equal partner working to safeguard the public values inherent in private land.
>
> By forest conservation, we include the range from the preservation of extensive natural areas to sustainable management and use, conditioned by landowner preferences. An area-wide plan would help guide and facilitate, but not direct where activities take place.

THE HISTORIC CONTEXT

For millennia, the northeastern U.S. has been heavily forested with a diverse array of species and ecosystems. In recent years, many beneficial attributes of these forests have been recognized. They provide habitat for a varied array of wild creatures, help cleanse the air, beckon recreationists, provide many natural resources and economic benefits, and create an esthetic backdrop for many human enterprises. Operating as interconnected ecosystems with wetlands and aquatic habitats, forests also play a crucial role in storing and regulating precipitation, thereby helping moderate climate, diminish flood peaks, and augment drought flows.

Despite these important contributions, forests are often overlooked or valued principally as developable real estate. Only infrequently do they become targets for conservation-based, public policy initiatives. We believe it is time for the Massachusetts forest, and others like it throughout the United States, to receive the full public recognition and attention they so richly deserve.

The story of the Massachusetts forest (Kittredge 2003) is one of dynamics and resilience (Appendix B). Once nearly 70% removed for farms and communities, it is now approximately 60% returned, the result of shifting human populations and changing land uses. Although ranked the third most densely populated state in the nation, Massachusetts, astonishingly, is the eighth highest in percentage of land area in forest. This has happened despite heavy cutting, other human impacts, and major hurricanes. Massachusetts today has more woodland biomass than at any time in the past two hundred years.

Despite this abundance, Massachusetts remains a major importer of forest-related materials with 98% of its needs currently being met by forests elsewhere. A recent report (Berlik et al., 2002) argued that there were strong environmental arguments for increasing the local contribution of natural resources. These authors proposed an approach coupling preservation of extensive resources, increased ecologically sustainable management of forests, and major efforts toward the conservation of resources. Massachusetts could well be the working laboratory to test out such an approach.

More than three-quarters of the Massachusetts forest is in private, non-industrial hands. Thus, what happens to this major resource will be determined by the actions of some 235,000 individual owners. As land changes hands and ownerships become increasingly fragmented, an estimated 20,000 new owners are added each year. Most have never lived adjacent to a forest, nor fully understand its processes and values, but all are potential advocates for the secure and productive forest environment we seek.

RECOMMENDATIONS AND CONCLUSIONS

Our report reaches two general conclusions that are developed in more detail in the body of this report.

First, given the fact that some three-quarters of the nation's forests are in private ownership and that these, not the national forests, provide the bulk of the nations forest-related needs, the paper suggests that the time may be at hand for the federal government to accelerate its leadership and support for area-wide configurations of state, local, and private ownerships jointly managed for forest conservation.

Second, Massachusetts has an opportunity to be a national pioneer in advancing such forest conservation on its own, as well as in conjunction with federal agencies. Few other largely urban states have the equivalent heritage of tradition, policy, laws, and oversight necessary to make responsible forest stewardship a reality. In our judgment, a significant opportunity is now at hand for joint federal-state action.

Program Initiation

We believe that Massachusetts in 2004 should consider establishing a new system of state stewardship forests. Stewardship forests would differ appreciably from the

state forests that presently exist, for they would be composed of private as well as public lands and be managed collaboratively.

In the interest of offering stewardship opportunities for portions of the state beyond western Massachusetts, and providing opportunities for a broad range of forest conservation, we propose that stewardship forests not be limited in either size or location. Since acts of responsible forest conservation do not necessarily require intensive management we envision stewardship forests of many different kinds and purposes. Having a variety of areas would provide creative opportunities for proponents, stimulate an awakening of interest in forests locally, and encourage the state to view forests as holistic environments.

GOVERNANCE

Central to the stewardship initiative recommended is a process not just of landowner participation, but active involvement in governance. We visualize arrays of public and private forest land, committed voluntarily, where decisions on their conservation, use, and development are acts of co-management. By co-management we mean not just participatory planning, but decisions on actual uses of the forest that are brought about after consultation with others. Co-management will not lessen state or private owner authority to direct activities on lands they own or control. It will merely enable the state to facilitate the management of all lands, public or private, in the area designated for stewardship through a collaborative, information-driven process. Fortunately, there are already precedents available for what we have in mind.

Mary Chapman's working paper, "The Federal Role . . .", reviews the opportunities for cooperative action provided by the Clarke-McNary Act of 1924, the Cooperative Forestry Assistance Act of 1978, and others. Each federal program relies generally on the tools of technical and financial assistance, usually extended on a cost-shared basis. Invariably, state forestry agencies and state cooperative extension services are the conduits through which federal cooperative aid flows. In recent years, other approaches have been tried — for example, the 2000 federal legislation establishing the Valles Caldera National Preserve in New Mexico, incorporates co-management by giving a set of public/private trustees, not the Forest Service, the major responsibility for management decisions and future financial support. The most recent cooperative innovation has been the action by a coalition of state and private interests calling for the establishment of a federally-designated stewardship area in the Highlands region of New York, New Jersey, and eastern Pennsylvania.

Closer to home, is Canada's Model Forest Network initiated in 1992 (see Kittredge, "Forests and Forestry in Massachusetts," Appendix B). In the Fundy Model Forest in New Brunswick and the Bas-Saint-Laurent Model Forest in Quebec, owners and managers of forests, both public and private, are now coming together regularly to share views and exchange ideas on how to promote sustainable forestry. This reflects the viewpoint offered by consulting forester, William Ticknor ("New Institutions for a New Forestry," 1992), that something as simple as a voluntary, forest ecosystem-oriented council of managers, devoted to education, information, interpretation, expertise-sharing, and basic communications, can be the first step toward effective, area-wide cooperation. In Massachusetts the new for-profit Woodlands Cooperative, and its allied non-profit Institute, have already attracted a significant group of private landowners, many from the western part of the state.

Any vehicle chosen must provide for full representation of the interests involved (see Moir, 2003). For an area such as the northern Berkshire County in western Massachusetts with perhaps 1,000 private landowners, let alone an array of state, sub-regional, and local jurisdictions, and a wide range of economic and environmental interests, achieving equitable representation will be a challenge. However, by sub-regionalizing the area into more modest, landowner-selected configurations, and then aggregating delegated representatives on a region-wide basis, actions can be taken on an open and democratic basis.

Representation by organizations is another possibility. Experience has shown that as long as an interest feels it is properly represented, individual participation in the governance process may not be necessary. And as long as the stewardship activities are enabling, not mandatory, then whether or not to participate in the program remains reserved for individual decision.

In developing consensus, the governing institution must learn to listen carefully and find ways to bridge differences. In this fashion, collaborative forms of leadership will emerge naturally. A system of "soft" services, such as planning, information, and communications, will be better received than "hard" actions of a directive, proscriptive, or regulatory nature. One useful technique is to set goals initially that are modest and meaningful in both substance and time frame, and celebrate a series of small successes rather than waiting for one pyrrhic accomplishment.

For an area like western Massachusetts, given the fact that the forest resource is primarily in private hands, a central question will be whether government should be centrally involved at all. The research available suggests that there are distinct benefits to be gained from active participation by higher jurisdictions. First, the level of information and know-how available to participants will be appreciably greater, as will be the prospects for financial

and technical assistance. Second, since system-wide ecological and economic assessment are now required of many public agencies, a governmental presence will tend to elevate the discussion of management objectives and options beyond the parochial and the particular. Third, by including publicly owned areas in the stewardship area, a larger critical mass of forests will be assured. And fourth, the regulatory "sticks" of government can be utilized constructively to supplement the "carrots" of grants and services.

However, if government lands are to be included, the principle of co-management must be understood properly. While individual landowners would not be required by the stewardship entity to take actions contrary to their wishes, so should governmental decision making be similarly reserved. The collaboration sought should arise naturally — the result of a commitment to shared goals and the receipt of mutual benefits — through reason and persuasion.

OPTIONS FOR INSTITUTIONALIZATION

How such an institution for participatory governance should come about is another interesting question. Fortunately, one option available is the provisions of Chapter 491 of the Acts of 1996, the state's environmental joint powers agreement enabling act. Under this unusual statute, interests of any kind, of any size and at any level, for any environmental purpose and any geographic area they may elect, can petition the secretary of environmental affairs for the issuance of a charter creating a joint powers entity. The act creates no new powers or resources, nor reduces existing authorities. It simply facilitates the joint exercise of authorities and the use of personnel, facilities, and resources the participants already have. Of particular relevance are the provisions in the enabling act permitting the inclusion of federal agencies and agencies of adjoining states. Thus, a western Massachusetts joint powers agreement could serve as an umbrella instrument to ensure the participation of those involved in the resource as a whole, such as similar forest areas in New York and Vermont and the federal government's Forest Service and other agencies.

The bottom line of the above can be put rather simply. Whatever means is chosen to activate the long-term, area-wide, forest conservation and stewardship program visualized for western Massachusetts, it must be bottom up rather than top down. And those who participate in its programmatic manifestations must be the originators of the action and an integral part of its subsequent governance processes.

SECURING A SUSTAINABLE FOREST LAND BASE

Once landowners have become convinced of the desirability of area-wide forest conservation and stewardship, efforts should be made to secure an extensive, relatively unfragmented, forest stewardship area of high value. To do so will require the application of Geographic Information System (GIS)-based planning, close consultation with landowners and, ultimately, agreement on where and how protection can be assured. The number and sizes of the ownerships involved will dictate the type of stewardship to be employed. Where possible, we recommend the use of conservation easements although fee purchase will remain an important option in some circumstances.

Easements leave the bulk of the land interest in private hands, thereby continuing to involve the landowner in its management and allowing the property to remain on the local tax rolls. Easements also guarantee the opportunity to build a long-term, continuing relationship with the landowner.

Consistent with the recommendations above, easements should be responsive to individual landowner needs, not simply a fixed, standard document. The compensation offered might consist of a mix of cash payments and professional advisory services. In this fashion, the landowner would not only have an incentive to engage in stewardship activities and the state would meet its obligations for continued involvement rather than making a single act of land acquisition.

To help assemble stewardship forests we believe that the Executive Office of Environmental Affairs and its component agencies should offer state lands as a core component. The size and percentage of public versus private lands should remain flexible. Non-profit or other public lands could also serve that purpose. Management personnel should be encouraged to identify areas suitable for stewardship forests and participate actively in their establishment and management.

Consideration should be given to reprogramming existing state and federal assistance funds for the initial education and outreach needed to advance such programs. In addition, a portion of the state's 2002 $750 million environmental bond issue should be released by the governor and allocated to stewardship forest acquisition. A portion of the bond issue should be available to match any federal assistance funds obtained and to pay for the services required.

The EOEA's draft proposal for an initial stewardship area of approximately 130,000 acres on the Berkshire Plateau, of which 35,000 acres are already in state or quasi-public ownership, seems persuasive. But we foresee other areas in the Commonwealth where the principles of a stewardship forest would be applicable.

As long as an area met one or more of the proposed criteria listed below, even a few well-cared-for acres in an urban or suburban setting should be able to qualify as stew-

ardship forests. They should not be limited as to either size or location. However, each should be multi-jurisdictional and be in the nature of a public/private partnership. Having a variety of potential stewardship areas would provide creative opportunities for proponents, stimulate an awakening of interest in local forests, and encourage the state to view forests as holistic environments.

Specific goals and objectives might include:

1. protect system-wide ecological, biodiversity, or hydrological values;
2. preserve heritages of local history, character, and culture;
3. provide opportunities for outdoor recreation and use;
4. furnish hands-on learning environments for adults and youth;
5. provide demonstrations of responsible forest management in practice;
6, encourage the development and growth of resource-based economies;
7. prevent sprawl and channel development in responsible directions;
8. reduce the worldwide ecological footprint by encouraging the use of locally-grown materials;
9. enable forest owners to actively participate in and directly shape their own, their families', and their communities' futures.

PROGRAM AND OPERATIONS

Research suggests that stewardship forest owners will respond best if two types of information are available: 1) data indicating resource values on a larger, system-wide basis and landscape scale; and 2) evidence to show how collective attention can either increase benefits or decrease threats. To date, the threat of development has been the primary motivating force for much of the cross-boundary cooperation in western Massachusetts (Finley 2002). Absent a persuasive exposition of system-wide values, it is not surprising that landowners generally rest content with the way their forests meet their own perceived values and see no reason to cooperate until threat or opportunity intervene.

For the state's new stewardship areas, we suggest the objective should be to anticipate, understand, and manage, not simply prevent change. Thus, we foresee stewardship entities acting to channel, not just forestall development, recognizing in their planning, as the EOEA's 1999–2000 Forest Vision team recommended, the opportunity to ecologically enhance transportation corridors and targeted development areas as well as to manage the land itself.

Consistent with the principles of participatory governance expressed previously, we believe that those responsible for a designated stewardship area should first and foremost be free to take whatever actions they deem appropriate to meet whatever is perceived to be in the best interest of the region. Thus, some areas may elect to simply communicate, convene, confer, and coordinate, leaving subsequent collaborative action as the direct responsibility of the participants themselves. Other areas may choose to be more pro-active, launching extensive studies and planning, sponsoring new programs and projects, and carrying out activities with a substantial budget and staff. The minimum core level of investment will depend upon the resources available and the areas of emphasis selected. In short, the policy of the Commonwealth should be to simply let many flowers bloom.

At the very least, every stewardship area should strive to become an area-wide repository of information, offering landowners and cooperating institutions one-stop shopping for the latest in data, planning, practices, and experience, using the Internet as an added means of communication.

But as individual owners are approached by interested timber operators and buyers (see Kittredge, "Forests and Forestry in Massachusetts," Appendix B), each stewardship unit should be the place landowners can turn to for a professional second opinion. These advisory services should be supplied at public expense and through certified consulting as well as public foresters.

For the larger program aspects, Massachusetts stewardship proponents would do well to examine the eight basic strategies set forth recently for the Highlands stewardship area to the south (Phelps and Hoppe 2002). They include:

- informing people about resource values;
- providing consistent and updated information for decision-makers;
- promoting stewardship and protecting landowner equity in private lands;
- providing current and new information on management issues and practices;
- acquiring easements and lands for conservation purposes and compensating private landowners and local governments for conservation of natural resources;
- improving state and local land-use planning practices;
- improving and coordinating regional, interstate, and intrastate conservation efforts;
- using indicators to measure and monitor regional change.

Thus, the outcomes we have in mind are more open-ended than immediately quantifiable — more procedural than tangibly substantive. If there is to be a bottom line, success will be measured by the numbers of owners participating, and areas of forest in secure condition and in caring and responsible hands, once the program is underway. Under such circumstances, we are confident that the resource values therein will be assured for generations to come.

OPPORTUNITIES FOR ACTION

If the above is used as a basic framework for a state-wide, forest stewardship program, here are some of the tangible opportunities beyond simply western Massachusetts that seem to be available. Although they illustrate one or more of the nine core objectives listed previously, not all are expected to become formally designated state stewardship areas.

With respect to system-wide values, a stewardship area built around the heavily forested Quabbin watershed would help protect water supply, wildlife, wild lands, scenic, and recreational values. In return for helping the Commonwealth protect the non-publicly owned portions of the north branch of the drainage, private landowners could avail themselves of the professional expertise and ecological benefits provided by the critical mass of forest lands held by state agencies. A stewardship initiative at Quabbin could expand upon the service forester services now being offered to the area with the assistance of the MDC and the state.

Similarly, a stewardship designation on the west branch of the Westfield River in west-central Massachusetts would provide an opportunity to engage the more ecologically oriented forest matrix protection initiative of The Nature Conservancy and Trustees of Reservations.

The chance to protect and sustain local heritage interests related to the forest is well-illustrated by the extensive, still-natural forest at the edge of Sturbridge Village in central Massachusetts. Here would be an ideal opportunity to carry out modern stewardship practices before a backdrop of recreated eighteenth-century living, economic, and cultural facilities.

In a portion of the Pocumtuck Hills near Shelburne Falls in the Connecticut Valley lies the oldest, continuously managed private forest in the Massachusetts Tree Farm system. The local school system, with assistance from the private Mary Lyons Education Fund, Inc., now sponsors hands-on learning experiences for students and the general public to acquaint them with these forests and their conservation.

The future of the Route 2 corridor, stretching all the way from Boston to Williamstown in western Massachusetts, has been the focus of attention recently by the Rappaport Institute and associated institutions. The emphasis has been on environmentally sensitive ways to advance the development and growth of resource-base economies and to channel growth in responsible directions. An example of this approach has been the North Quabbin Woods project of the New England Forestry Foundation, an experimental local conservation and development project supported by the Ford Foundation.

As part of his conceptual suburban Boston Thoreau Country Forest, Brandeis University environmental historian Brian Donahue, an advocate of the judicious management of forested conservation lands, visualizes town landfill areas providing sites for the conversion of local materials to local uses, thereby providing local economic opportunities and helping reduce Massachusetts's worldwide ecological footprint.

And in the Canton-Milton area of the Blue Hills Metropolitan Reservation is an extraordinary opportunity to demonstrate how public and private owners can directly shape their own, their families', and their communities' futures through cooperative, stewardship action. The David Jeffries tree farm lies adjacent to the reservation and has been actively managed for half a century (Connor 2001).

THE FEDERAL ROLE

Threaded throughout this report is a conviction that the federal government can and should play a useful role in advancing a forest conservation stewardship program in Massachusetts. The options we have considered range all the way from a new national stewardship forest dedicated to public/private cooperation, to a national system of federally designated private forest regions, to a more targeted use of existing programs, such as forest legacy, forestry incentives, stewardship incentives, urban and community forestry.

We offer no judgments on the merits of these options, but observe that present federal support for non-federal forestry seems inadequate and unnecessarily fragmented. The integrated approach we seek is well-illustrated by the support we received from the Forest Service for this project. For example, the funds for the inquiry came from the research branch; the state's inquiries were aided by personnel from the regional forester's office in Milwaukee; and an important program review memorandum was contributed by the Service's State and Private forestry branch.

In 1996, the National Research Council (NRC) of the National Academy of Sciences assessed the overall federal role in non-federal forestry. The NRC report generally supports the need to improve the ability of the federal govern-

ment to identify the national interest in nonfederal forests. It identifies maintaining sustainability as a federal interest and assigns priority to increasing investments in nonfederal forests to meet this end. Supporting roles suggested for the federal government include: 1) developing innovative programs; 2) finding new institutions for collaborative and partnership programs; and 3) strategic planning to identify national interests based on a comprehensive policy that is to be developed for the nation's forests.

After the NRC study was completed, a $500 million action plan was developed internally by the Forest Service (Rains 1998). The Forest Service report concluded that many of the NRC report's recommendations were "vital" and deserved immediate attention, and others were "extremely important." However, despite encouragement from the National Association of State Foresters, little has been done subsequently to implement the Council recommendations.

In her analysis, although Chapman (2003) supports the current federal role based on a non-regulatory, voluntary, incentive-based approach, the provision of technical and financial assistance, and close cooperation with state forestry agencies, she urges a greater emphasis on bottom-up approaches, a focusing of federal assistance on high priority issues and regions, and better delivery of services through cooperative programs.

Applying these general findings to the forest resource in Massachusetts and, in particular, western Massachusetts, we conclude that without a clear and compelling need for direct federal involvement, and evidence of a public willingness to entertain a management-level federal presence analogous to the creation of national forests in the White and Green Mountains of New England and the Finger Lakes region of New York, the Commonwealth's best and most immediate recourse will be a state-initiated program carried out with encouragement and support of the Forest Service and other federal agencies.

Whether or not the nation's premier forestry agency, the U.S. Forest Service, is in a position to respond is more conjectural. The agency is presently hard-pressed on many fronts. Its structure is trisected into distinct and quite independent national forest, research, and state and private branches with an unequal distribution of resources among them. The Service has long been wary of sharing with others its authorities and responsibilities for forest management. And in this era of pressing international responsibilities and spiraling deficits, the policy climate in Washington seems hardly conducive to new initiatives.

Yet, given the growing public interest nationally in cooperative approaches, an approach that would be well-defined, serve as a model for other parts of the eastern region, come about without any new authorization, and not threaten existing programs could be a timely and attractive proposition for the Forest Service and stand a good chance of gaining Congressional support. In our judgment, a Massachusetts-sponsored forest stewardship initiative would do just that.

At present, Massachusetts receives funds annually from the Forest Service in support of its Forest Land Enhancement Program (FLEP). FLEP funds support various cost-sharing programs aimed at the stewardship of private forests, such as the preparation of forest management plans and pay for a portion of the state's service forester expenses and its limited extension and public information program. Like all such funding situations, the expectations in each category have grown over the years and have created a measure of inflexibility in their allocation, but some degree of reallocation could well be in order.

The forest legacy program of the Forest Service is also administered by the state and private forestry branch, but as a special pool of funds. It supports a program to help the states acquire easements private forest land in order to reduce fragmentation and prevent conversion of the land to non-forestry uses. In recent years, Congress has taken an active interest in the program, often supplying funds on an earmarked basis. This fund source would be available to support a forest stewardship initiative.

But of all the possibilities, we have been the most intrigued by the precedent of a special innovations fund administered by the eastern state and private forestry office. This was singled out for commendation by the Pinchot Institute for Conservation in a special report to the Forest Service (Hagenstein April 2001). In fact, the Pinchot researchers recommended that 20 to 40% of the region's total cooperative forestry funds, not the level of 5% at the time, be withheld and made available for discretionary spending on innovative projects. Reflecting on our own experience in receiving support from all three branches of the Forest Service, we now suggest a larger, Service-wide fund obtained through modest assessments on all three branches, such sums to be available for innovative cooperative projects nationwide, not just in the eastern region.

THE NEXT STEPS

Upon assessing the status of Massachusetts forest, it is clear that the state has a resource that is, privately owned, on the threshold of active parcelization, fragmentation, and ownership change, and subject to short-term and unplanned harvesting. By way of contrast, a forest conservation and stewardship approach of the type we have suggested would take steps to prevent permanent conversion to other uses; protect, preserve, and restore its natural, scenic, recreational, and ecological values; encourage management that

is proactive rather than reactive; and enable a focus on the long-term protection of the forest's goods and services.

To do so, we believe, will require extensive and imaginative approaches that are as much human as forest-oriented. For example, there will need to be opportunities for learning, capacity, and community building through effective forms of education and communication. A genuine sense of accountability must be developed in those who own or control our forests. More than anything, however, there needs to be a commitment to a way of life in which the forest plays a recognized and integral role.

In order to accomplish the above, there must be agreement that the target forest extends beyond the constraints of individual ownerships and jurisdictions. The scales necessary for such an approach must reflect both spatial and temporal realities. While the needs of western Massachusetts and similar areas seem to fall largely within landscape or regional configurations, the actual control of the resource is likely to remain firmly in state and local hands. Thus, ways must be found to bridge individual ownership or political boundaries and achieve a truly coordinated, cooperative effort.

The methods used to attain these objectives will have to take many forms. Some will be in the nature of basic education and communication, resulting in a repository of information and experience that all can draw upon. Cost-sharing opportunities involving technical assistance, incentive grants, modern planning (e.g., GIS), and research are other useful methods that can be employed. Forest management itself can be instructive if it is done within a context of critical judgment and reflective practice. Engaging landowners and the public directly in planning and decision making can help provide a sense of accountability for the resource as a whole.

And so what might the next steps be?

First, unlike many previous policy inquiries, this report focuses on a real opportunity in a real place. We see no reason why Massachusetts should not, and could not, take the lead in showing the way to an effective, state-initiated, forest conservation and stewardship program. Tangible evidence of need, commitment, and success here could be persuasive to others elsewhere. We are convinced that such a program could have significant implications state-wide and even nationally by offering examples of landscape-level choices and decisions involving a mix of public (mostly state) and private lands. The pilots would demonstrate how some public values, such as increased protection for old-growth forest and associated wildlife habitat, might be provided collaboratively without unduly compromising the goals of private owners.

Second, we believe that leadership must also occur at the national level to begin to gather together all those who share a mutual interest in advancing cooperative forms of public/private forestry. We challenge respected organizations like American Forests, the National Woodlands Owners' Association, and the Pinchot Institute for Conservation to consider sponsoring a small working conference of selected eastern forest stewardship leaders, and others, to discuss how, when, and where their aspirations might be manifest in new federal policy and programs.

Finally, if a national colloquy on this subject occurs in 2004, the forthcoming celebration of the Forest Service centennial in 2005 would seem to present an ideal opportunity to bring many of these needs to the direct attention of administration and Congressional leaders, and the public as a whole. The centennial agenda could include a thoughtful presentation of opportunities and needs in the nonfederal forestry area.

If so, as the National Research Council recommended in 1997, the nation will have taken the first step toward ensuring the long-term integrity of forest ecosystems that contribute so much to the well-being of the nation's citizens.

APPENDIX A. PARTICIPANT PROFILES

Dr. Charles H. W. Foster is an adjunct research associate at Harvard's Kennedy School where he specializes in regional environmental and natural resource issues. He was previously Massachusetts's commissioner of natural resources, state forester, secretary of environmental affairs, and dean of the Yale School of Forestry & Environmental Studies.

Dr. David R. Foster, a botanist and forest ecologist, is director of the Harvard Graduate Program in Biology, director of the Harvard Forest, and principal investigator for the Harvard Long-Term Ecological Research Project.

Dr. Perry R. Hagenstein, a University of Michigan-trained forest economist, is chairman of the New England Natural Resources Center, president of Resource Issues, Inc., and a former president of American Forests. He served previously on the staff of the Public Land Law Review Commission and as a member of the National Resource Council's study committee on the status of the nonfederal forestlands of the United States.

Dr. Alice E. Ingerson, a cultural anthropologist who specializes in the use of participatory history for land conservation and management, was previously the associate director of the Arnold Arboretum's Institute for Cultural Landscape Studies, director of publications for the Lincoln Institute of Land Policy, and editor of the Forest History Society's quarterly journal *Forest & Conservation History.* She currently teaches in the Arboretum's Landscape Institute and at the Environmental Citizenship Academy, University of Massachusetts (Boston).

Dr. David B. Kittredge is Massachusetts's extension forester and a faculty member at the University of Massachusetts's Department of Natural Resources Conservation. He served previously as the chairman of EOEA Secretary Robert Durand's state-wide forest visioning group.

Dr. Robert B. Moir is a development officer and lecturer at Hampshire College. He recently graduated from the doctoral program in environmental studies at the Antioch New England Graduate School in Keene, N.H. His dissertation on a new form of participatory ecological governance was derived from participation in, and analysis of, the jointly managed Boston Harbor Islands National Recreation Area of the National Park Service.

James N. Levitt, the former director of the Internet and Conservation Project of Harvard's Taubman Center for State and Local Government and a native of Nebraska, is a graduate of Yale's School of Organization & Management, an experienced business consultant and entrepreneur, and an active board member of a number of state and regional non-profit conservation organizations. He is the founder and director of the Program on Conservation Innovation at the Harvard Forest.

Mary Chapman spent seven years in New England as a development specialist for the State & Private Forestry branch of the USDA Forest Service, including service on its Northern Forest Lands and N.Y.–N.J. Highlands study teams. Chapman is currently the Manager of The Forest Stewards Guild, a national organization of natural resource professionals dedicated to practicing ecologically responsible forms of stewardship on public and private lands.

Keith Ross, former vice president for land protection of the New England Forestry Foundation, served as a member of the National Academy's study committee on nonfederal forest lands. Renowned for his work in securing the largest permanent conservation easement in the history of the United States (the Pingree Forest Partnership in Maine), Ross currently works as a conservation specialist for LandVest.

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FORESTS AND FORESTRY OF MASSACHUSETTS

David B. Kittredge

Author contact information:
David B. Kittredge, Jr.,
Extension Forester and Associate Professor
Department of Natural Resources Conservation
Holdsworth Hall
University of Massachusetts, Amherst
Amherst, Mass. 01003
email: dbk@forwild.umass.edu

Though many consider the entire state of Massachusetts to be essentially an extension of the greater Boston metropolitan area, the Commonwealth is actually quite heavily forested. Estimates vary, depending on the definition of "forest" and the techniques used, but in general, approximately sixty-two percent of Massachusetts land is wooded (Alerich 2000). Among the fifty states, the state ranks both eighth in its percentage of land in forest [USDA Forest Service's Forest Inventory and Analysis Project(FIA)] and third in density of population (U.S. Census, 2001). Indeed, in population density Massachusetts is on a par with Japan, denser than Germany's, and not much less dense than the Netherlands (World Resources Institute 1998):

POPULATION DENSITY
(people per square mile)

Massachusetts	813 (in 2001)
Japan	865
Germany	611
Netherlands	1,201

These figures are misleading, however. Many communities in western Massachusetts are as much as 90 percent or more forested (Massachusetts Geographic Information System (GIS) 1999), and support population densities that would be considered quite sparse or rural (e.g., 39–78 people per square mile; MISER, 2002). Indeed, when considering the forests of Massachusetts, it is more appropriate to distinguish the western, rural and heavily forested portion from the eastern more densely populated and developed portion, (see figures 1–4).

To understand the current condition of Massachusetts's forests, it is vital to have an appreciation for their past. On the basis of abundant precipitation and relatively fertile soils following recent glaciation, the natural successional trajectory in the northeastern United States is for land to be occupied by trees. Natural regeneration is common following disturbance. The most common form of natural disturbance is wind-based, ranging in intensity, frequency, and spatial scale from hurricanes to smaller events associated with violent thunderstorms. Prior to European settlement, the natural condition across Massachusetts was forest, ranging in age and structural composition based on the time elapsed since the establishing disturbance.

The species composition of Massachusetts forests is relatively diverse by temperate standards. The state lies in a zone where species more commonly associated with northern latitudes (e.g., sugar maple, beech, yellow birch) can be found in mixtures with those more typical of southern circumstances (e.g., oaks, hickories). Hemlock and eastern white pine are the predominant conifers. Typical early successional species that follow disturbance are paper birch and trembling aspen. Mid-successional forests are dominated by mixtures of red maple, several oak species, black birch, white ash, white pine, and hemlock. Later-successional forests are composed of beech, hemlock, white pine, and sugar maple. Trees of these species can grow to be 300–400 years old, in the absence of disturbance.

European settlement in Massachusetts created a new and much more drastic form of disturbance. Starting in the mid-seventeenth century in the east, and proceeding westward, forest was converted to agricultural land use to support a growing human population. Highly productive soils were converted to cropland, and those of lesser capacity (based on fertility, slope, or rockiness) were cleared for pasture. Some lands, generally either too wet or not otherwise valuable for agricultural purposes, were left in forest, to provide firewood and building materials. It is estimated that as population and agricultural land use in Massachusetts expanded, as much as seventy-five percent of the landscape was dedicated to some form of farming.

Socioeconomic factors shifted by the mid-nineteenth

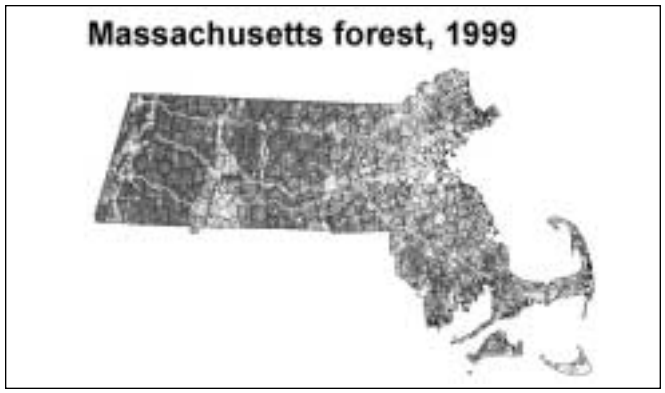

Figure 1. Massachusetts forest with primary transportation arteries.

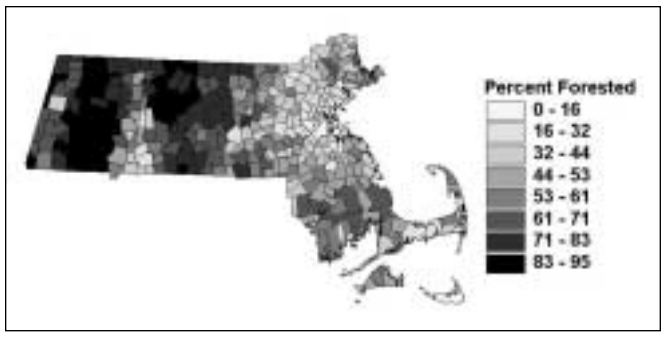

Figure 2. Percent of a town that is in forested land use.

century, however, leading to abandonment of agricultural lands. Families either moved into growing cities, attracted by the prospect of regular income from industrial jobs, or west as the nation expanded, to farm on productive soils with fewer rocks. The result was that many open lands had little value, and were simply abandoned by their owners. Natural succession proceeded following this historically unprecedented set of circumstances. While succession normally occurred in forest conditions following windstorms of varying extent and intensity, after abandonment natural regeneration established trees on thousands of contiguous hectares of open grassland or formerly plowed fields with exposed mineral soil.

The result of this unique set of historical circumstances was the establishment of atypical pure white-pine stands on plowed lands, and other mixed forests elsewhere. In both cases, forests were newly established on agricultural soils with virtually no coarse woody debris or native forest flora, and an altered seed bank. By roughly 1850, the overall consequence was a landscape dominated by young, natural, but even-aged forest. It is likely that this had not been the case since the retreat of the glacier roughly 10,000 years before.

This young, even-aged, and non-natural forest landscape proceeded through succession to accumulate woody biomass and diversify in species composition. This dynamic process of an aggrading forest was "interrupted" or dis-

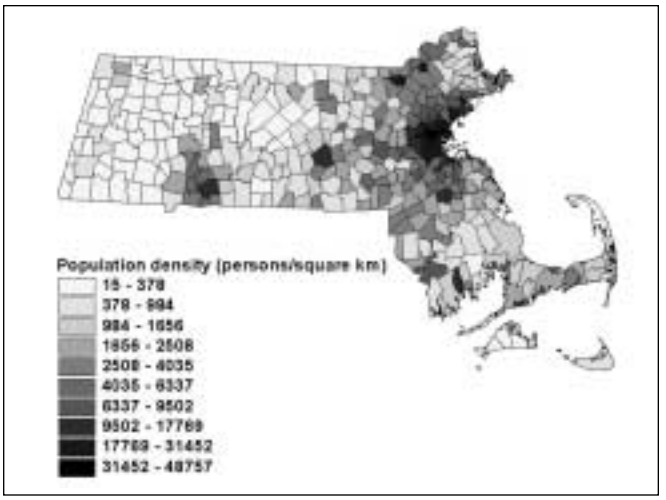

Figure 3. Population density (person/km^2) by town.

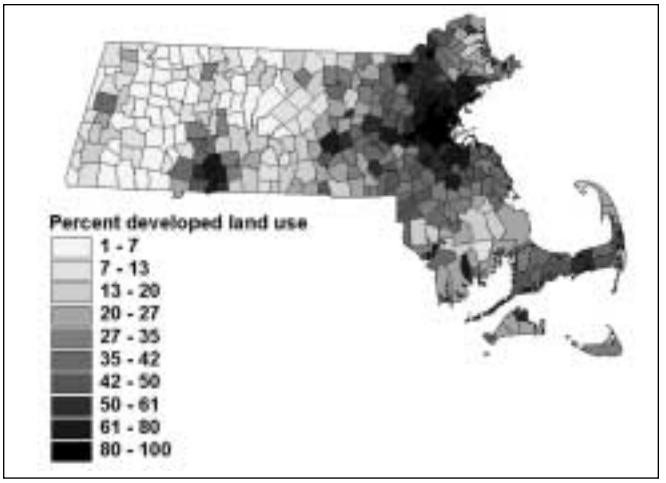

Figure 4. Percent of a town that is in developed (i.e., residential, industrial, or commercial) land use.

turbed several times, for example, in the early twentieth century when even-aged pure white pine stands had achieved an economic condition that would support harvest of timber for boxboards. In other parts of Massachusetts, maturing hardwood forest was cut repeatedly for charcoal to fuel industrial production in the days before the use of coal and oil. The general influence of natural disturbance continued to effect the forest, but a young, even-aged landscape is less susceptible to windstorms. An exception is the hurricane of 1938, which reverted parts of the Massachusetts forest to an early successional condition.

In general, in spite of a few large-scale disturbances, and the ongoing level of natural disturbance working in the background, the resilient forests of Massachusetts at the onset of the twenty-first century remain relatively young in terms of development, and even-aged in structure. They continue to accumulate woody biomass (figure 5), to the point that today, they probably have on average more wood per hectare than at any time in the past 200 years.

While natural disturbance continues to influence the

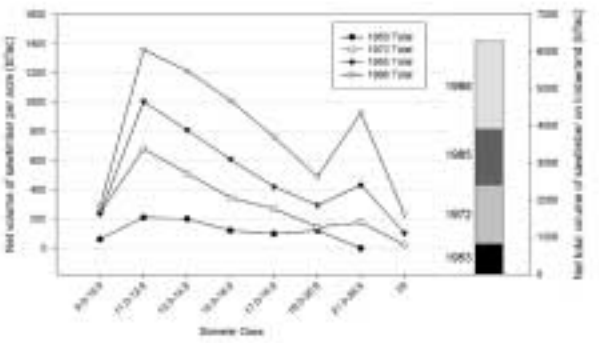

Figure 5. Accumulation of volume/ha over time, by diameter class, in Massachusetts forests. (Berlik et al., 2002).

aggrading forest landscape, its future in an absolute sense lies in the hands of thousands of people. Specifically, private families, individuals, and non-industrial organizations and trusts own more than seventy-five percent of all forest in Massachusetts (Alerich 2000). Communities control the fate of roughly ten percent of the forest, and three different state agencies collectively are responsible for twelve percent. Apart from some relatively simple zoning and wetland protection regulations, decisions about the forest in private, nonindustrial hands are guided by goals and needs of hundreds of thousands of owners. Whether their woods remain forested, are converted to some other land use, or produce timber on a sustainable or unsustainable basis is a function of decisions made by many people. The cumulative effects of these uncoordinated and often random decisions will influence the future of the forest statewide for decades to come. To understand the forest requires therefore an understanding of the people who own it and control its destiny.

Private forest owners and their attitudes have been studied for decades. Numerous reports consistently indicate that people own their land for noncommercial reasons, such as privacy, scenic beauty, wildlife habitat, outdoor recreation, and a place to live (Alexander 1986; Kingsley 1976; Archey and MacConnell 1982; Rickenbach, et al. 1998). The generation of income from the sale of timber invariably ranks low on a list of reasons for ownership. This is due in part to the fact that owner income is relatively high: the mean annual household income of Massachusetts forest owners is $60,000, and one-third of owners have annual household incomes greater than $100,000 (White 2001). Also, the value of standing timber compared to other household income is rather low. In addition to being relatively wealthy, owners tend to be older (mean age in Massachusetts is between fifty and sixty years) and well educated (e.g., at least sixty-three percent have a college degree in Massachusetts; White 2001). In addition, there is a common perception that harvesting timber is not compatible with the dominant reasons for ownership (e.g., aesthetics, wildlife habitat, privacy).

There can be, however, a gap between professed attitudes of private forest owners and their documented behavior. While numerous studies indicate little interest in harvesting, an analysis of timber harvest regulatory data indicates that as much as 80 percent or more of all harvesting in Massachusetts occurs on private lands (Kittredge et al., 2003).

Classic forest management on private lands in Massachusetts varies in its intensity and prevalence. It generally follows one of five "management models" (figure 6, Kittredge in review). Many owners prefer to simply "do nothing" (model A), either believing that this is the "best" course, or having inadequate time or effort to "do something." Some landowners sell timber to a logger on occasion (model B), but in this case it is without a management plan, prescription, or input from a forester. Likewise, some landowners sell their standing timber to a sawmill, which contracts with a logger for its removal (model C). This action may or may not involve professional forestry advice or development of a management plan. Some landowners engage the services of a private consulting forester (model D), who in turn arranges the sale of timber as part of a prescribed silvicultural plan. Alternatively, some owners work with a forester from the public sector (model E), who refers them to a private consulting forester. Some of these management models involve harvest, but it can occur in the absence of professional forestry advice.

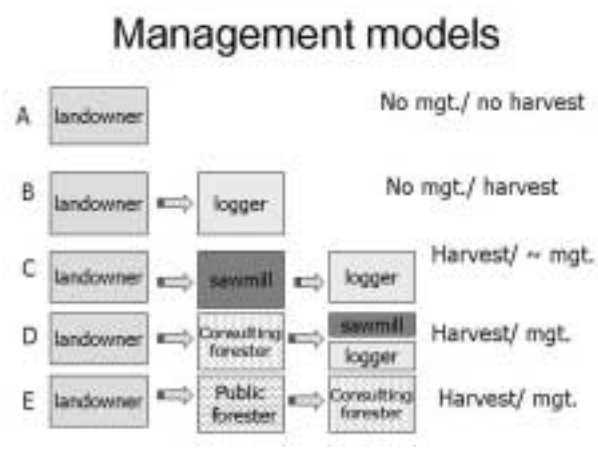

Figure 6. Management models on private lands in Massachusetts Kittredge, *in review*).

It is difficult to estimate landowner participation in the five different models. Indirectly, we know that fewer than twenty percent of eligible forest owners in Massachusetts participate in the current-use property tax program

(Massachusetts Department of Environmental Management 1999), which requires a ten-year management plan approved by a state forester (i.e., an indicator of model E or D). This low participation is in spite of a generous ninety-five percent reduction in the assessed value of the land, and a corresponding reduction in annual property taxes. Likewise, after a ten-year promotional effort (1990–1999) and a federal cost-share of seventy-five percent, only nine percent of eligible private family forestland has a ten-year forest stewardship plan on file (Wilkins 2000). Customarily, private forest owners have expressed little interest in harvesting or in the traditional approach to forest management, exemplified by developing and adhering to management plans (i.e., models D and E). This is not an unusual trend. Indeed, Birch (1996) estimated that in the twenty-state northeastern region, as few as five percent of all private owners, owning a total twenty-nine percent of the forest, have management plans. While we may not be able to clearly estimate participation in all five management models, it is clear that the majority of owners subscribe to models A, B, or C, either by accident, default, or informed preference.

Finally, it is not enough to simply understand private owners. While it is a laudable and logical goal, it is not an insignificant challenge, since there are thousands of them, and they are a "moving target," in that land changes hands. For example, in a recent study, average ownership was twenty-two years (White 2001), with fragmentation and parcelization annually resulting in more owners and smaller parcels (DeCoster 2000). Landowners do not make decisions about their land in a vacuum, regardless of the local context in which the land is located. To understand forest owners, their decisions, and the subsequent future of the Massachusetts forest, we need to understand the context in which the owners are making their decisions. There are socioeconomic and cultural factors that affect the forest and owners — e.g., real estate valuation and resulting property taxes; local bylaws made by well-meaning citizens that influence land management and ownership; zoning; neighbor attitudes and the "not in my backyard" syndrome; general landowner and community affluence; and small parcel size.

These issues are more of a factor in densely populated eastern Massachusetts than in the more rural western part of the state. In a recent study from Virginia, Wear, et al. (1999) estimate that commercial timber harvesting ceases to be a viable forest activity in areas where the population density exceeds 150 people per square mile. Similarly, Barlow, et al. (1998) showed that distance from urban centers (places with over 50,000 inhabitants) in Mississippi and Alabama was positively and significantly related to the probability of harvest (estimated by FIA plots).

Private landowner attitudes and decisions about their land are made in the context of trends and threats to forestland in their communities and surrounding areas. Massachusetts Audubon, for example, estimates that the Commonwealth loses almost forty-four acres of open space per day to development (Steel 1999). The latest results from the Forest Service Inventory and Analysis suggest that Worcester County, Massachusetts, lost as much as ten percent of its forest between 1985 and 1999 (Alerich 2000). When making decisions about the fate of their land, owners no doubt take into consideration the prevailing trends in their community.

Owner decisions about their land may be influenced by not only their own circumstances (household income, financial need, age, attitudes), but also other factors such as: physical size of the property (minimizing potential for commercial timber harvest; Kittredge, et al. 1996), high real estate valuation and property taxes, neighborhood use of the property for passive recreation, and the perceived stigma of doing something unpopular. All other factors held equal, the fate of a fifty-acre parcel in a densely populated community in eastern Massachusetts would most likely be different from the same property, owned by the same person, in sparsely populated western Massachusetts.

THE PARADOX OF THE MASSACHUSETTS FOREST

Massachusetts is a densely populated state with a broad forest "overstory" that provides a wealth of greater social goods/benefits. These ecosystem benefits include clean water, sequestered carbon, wildfire habitat, outdoor recreation opportunities, scenic backdrop to a rural tourism industry, protected wood, and employment. They are essentially provided free of charge by private owners, who are required to pay an annual property tax bill that supports local education. A healthy, fully functioning forest landscape will continue to provide these goods free of charge (Costanza et al., 1992; Allen and Hoekstra 1992; Woodley et al., 1993).

The challenge for the future is: how to encourage private forest owners to make good, informed decisions about the harvest, development, parcelization, or conversion of their land? This is especially daunting since most of the ecosystem services occur at landscape and temporal scales that far exceed average ownership size and tenure. The average private ownership in Massachusetts is ten acres; if all small parcels under ten acres are excluded, the mean rises to seventy acres (Birch 1996), which is still trivial compared to most ecosystem, watershed, or habitat function. The implication is that landowners should somehow cooperate or collaborate at larger scales than their own

property, but how to achieve this when they have shown no interest in classic approaches to even managing their own land? At stake is the potential that the cumulative effects of their uninformed, indifferent, or independent choices may impair the health and sustainability of the resource.

If all (or even most) landowners had ten-year forest management plans prepared by professional foresters, we could be reasonably assured that their actions would be the result of informed decision making and professional guidance. Foresters could conceivably knit together important aspects of these plans and make suggestions about management at larger ecosystem scales. The facts are, however, that even after foresters have spent decades trying to persuade landowners to approach management in this way, the vast majority of owners are not interested in a plan for their land. They have not been convinced that a plan is a necessary prerequisite for achieving their goals for their land. Most landowners seem to seek "something else" when it comes to their land and decision making, rather than the models D and E that forestry has been promoting for years.

In contrast to models D and E and a "textbook" management-plan approach to helping landowners make informed decisions, a new model is worth considering. Rather than develop an actual plan (which even if developed can often sit on the proverbial "shelf"), it may be more effective simply to promote communication and information-sharing among private owners across boundary lines. Ticknor (1992) proposed something like this in his concept of an "ecosystem management council" (EMC). He suggested that organizations at a relatively local level (i.e., watershed or ecosystem) provide the following services or roles, in an effort to improve private owner management: communication and facilitation of dialogue among diverse interest groups; education; information gathering and analysis; interpretation of information and putting broad regional objectives into practice at the community level; provision of expertise; and administrative support and institutional energy to maintain the other functions. These activities would result in heightened awareness among owners, and might attract the large segment of owners who have to date gone unserved. Most explicitly, Ticknor advised against including any form of control or regulation in the model. According to him, "the best model is one that relies on individual's willingness to voluntarily do what's right."

The functions that Ticknor outlines for an EMC are aimed at helping landowners make informed decisions voluntarily. Such information-sharing and communication between landowners can promote what Leopold referred to as an ecological conscience: "Ecology is the science of communities, and the ecological conscience is therefore the ethics of community life" (Leopold 1947). In Leopold's opinion, "the basic defect is this: we have not asked the citizen to assume any real responsibility. We have told him that if he will vote right, obey the law, join some organizations, and practice what conservation is profitable on his own land, that everything will be lovely; the government will do the rest." Facilitated information sharing and communication could enable landowners of a given community to cooperate and develop a local sense of ecological conscience. The resulting synergy could motivate some owners who heretofore have been unmoved by traditional approaches and messages. Also, this synergy between owners provides an opportunity to reach new landowners through their peers, which can be a more effective means of information dissemination.

Another example of a cooperation/communication model can be found in Canada. The Canadian Forest Service initiated the Model Forest Network in 1992 (Canadian Forest Service 2003). There are eleven large-scale model forests nationwide, in representative forest types. Model forests bring together owners and managers of forests who share a common goal of sustainable forestry. The model forest provides a forum to share views and exchange ideas on how to promote and achieve sustainable forestry in the surrounding area. The model forest is defined at a scale that is realistic for a working forest, but the rights of individual owners are not superseded by the organization. For example, the Fundy Model Forest in New Brunswick covers over 1,035,000 acres, and has thirty-four groups as members who cooperate to promote forestry in that area. Over 3,500 private families and individuals own sixty-three percent of this forest. In both the Fundy Model Forest and Bas-Saint-Laurent Model Forest (Quebec), forest owner associations are active participants, and cooperation among them is encouraged.

Since 1992 when Ticknor's idea of ecosystem management councils emerged, the Internet has exploded as a potential means to promote information sharing and communication. Indeed, in a 2001 survey of private Massachusetts forest owners, seventy percent had Internet access, and as many of half of them used the Internet on a daily basis (White 2001). Only nineteen percent of these respondents, however, acquire tree or forest information online. In a more recent 2002 survey of owners in Vermont, New Hampshire, and Massachusetts, seventy-four percent of respondents reported access to the Internet (Belin 2002). More than two-thirds of these respondents reported they would access an Internet site if it had *local* spatial information (maps and air photos), and more than half said they would access such a site if it had *local* conservation and recreation information. In a study of private forest owners in Connecticut, Sinclair and Knuth (2000) identified the important need for owners to see spatial information about

their land, and those of surrounding owners, in order to fully appreciate the need to cooperate, and the potential benefits. Also, Brunson, et al. (1996) reported in a multi-state study of owner attitudes toward ecosystem management that general interest existed, but more importantly there was a need to see examples before committing to participate. Use of the Internet to share examples could overcome this barrier.

It seems that the key to making information on the Internet relevant is making it local. Although there is a plethora of tree and forest information available online, it fails to motivate many owners, since it is not local and hence not relevant to their circumstances. Similarly, generic "courses" designed to teach owners are not effective, since they are not locally relevant, do not include spatially explicit information relevant to an owner's property, and require more time and effort than may owners have heretofore invested in their land. Foresters might lament that if landowners "only understood," they would then be better stewards, but fundamentally, many landowners are not convinced that they need to learn more about their land in order to realize enhanced benefits.

Finley (2002) showed that for landowners to consider some form of cooperation, they needed to recognize a compelling reason or there needs to be a catalyst to act. Landowners showed no interest in cooperating for cooperation's sake. Instead of cumbersome coursework or generic information, relevant online information could be made available in small, concise packages targeted to answer a specific question or issue at hand. Stemming the tide of local development was one reason landowners decided to cooperate with one another. Local development threats, consequences, and peer-to-peer landowner experiences could be made available online. It is quite possible that some variation on Ticknor's ecosystem management council or the Canadian model forests may be successful, especially if the Internet is used strategically to foster information-sharing about issues that either appeal to owners or threaten their perceived forest benefits.

CONCLUSION

The Massachusetts forest landscape is a puzzle of contradictions:

- There is more wood/acre than at any time in the last 200 years, yet Massachusetts residents only meet about three percent of their wood needs from Massachusetts forests (Berlik, et al. 2002). The number of sawmills and harvesters is decreasing (Damery and Boyce 2003).
- Landowners control most of the forest landscape and profess not to be interested in harvesting, yet they do!
- Statewide, Massachusetts is heavily forested and densely populated, but it is in effect a state with two "forests": the urban/rural interface, influenced heavily by sprawl, and the rural forest. This condition is dynamic, with the former increasing at the expense of the latter.
- Massachusetts citizenry depend on the free benefits from a healthy and functioning forest landscape that is owned by thousands of nonindustrial private families and individuals. In return for this generous provision of benefits, these owners are taxed to provide funding for local schools!
- Landowners profess interest in many things that would be enhanced by thinking more collaboratively — e.g., trails, recreation, wildlife, and protection vs. development and privacy — but they do not work together or cooperate with each other.
- Public interest would be served by landowners working together at a landscape scale (e.g., wildlife, water resources, scenic values), but the state does not recognize/ promote such cooperation/collaboration, in spite of the fact that more than seventy-five percent of the forest is in this ownership category. Instead it promotes conventional and well-worn approaches to forestry, which the facts show are not effective in attracting the majority of owners.
- The Massachusetts forest has proven over centuries to be resilient in the face of varied natural and human-induced disturbances (Foster 2002; Hall et al., 2002). But it now faces fragmentation and conversion to developed use, which have significant social and ecological implications of a far more permanent nature.

Most, if not all, other developed nations with "first-world" economies, temperate forests, and high population densities have a system of land-use regulations to limit forest loss, and forestry education and incentive systems to promote and reward forest stewardship. The former is probably not politically feasible in Massachusetts. Some form of the latter could be quite successful if it avoided the management models that have been proven not to appeal to the majority of owners. While this paper has focused on circumstances in Massachusetts, the issues reach far beyond the borders of the Commonwealth. Private families and individuals own most forestland in the United States east of the Mississippi. The trends of sprawl that adversely effect these lands radiate from virtually every urban center in the country. Some form of information-sharing and cooperation, facilitated by the Internet, may provide the

catalyst to empower landowners to work together, both for their own benefit, as well as that of society. Rather than a prescriptive approach of telling landowners what they should do, experience has shown that it is probably more effective and realistic to encourage landowners to "do no harm" to the land, to "look before they leap" and make informed decisions about the future of their woods.

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FIGURES

Figure 1: Massachusetts forest, with primary transportation arteries.

Figure 2: Percent of a town that is in forested land use.

Figure 3: Population density (persons/km^2) by town.

Figure 4: Percent of a town that is in developed (i.e., residential, industrial, or commercial) land use.

Figure 5: Accumulation of volume/ha over time, by diameter class, in Massachusetts forests [Berlik, *et al.* 2002].

Figure 6: Management models on private lands in Massachusetts [Kittredge, *in review*].

DEFINING A VISION FOR MASSACHUSETTS FORESTS

David B. Kittredge

Author contact information:
David B. Kittredge, Jr.,
Extension Forester and Associate Professor
Department of Natural Resources Conservation
Holdsworth Hall
University of Massachusetts, Amherst
Amherst, Mass. 01003
enmail: dbk@forwild.umass.edu

In 1999, the need for a comprehensive plan for the forests of Massachusetts was articulated in a position paper that resulted from a graduate seminar at Harvard's Kennedy School of Government (Foster and Foster, 1999). Prior to embarking on a plan for the collected set of ecological, social, economic, and political issues that define the forested landscape of the Commonwealth it was recommended that a simple yet thoughtful vision for the future of forests be developed. This vision would serve to define the broad endpoint or desired future condition for the woods of Massachusetts. The comprehensive plan would then define actions and assign responsibilities necessary to successfully achieve that set of envisioned future conditions.

Later that year, the Commonwealth's Executive Office of Environmental Affairs (EOEA) sought advice on the development of a team to compile a forest vision. Assembled by a member of the faculty at the University of Massachusetts at Amherst, the team of twelve was a mixture of diverse disciplines and interests or stakeholders. Included were representatives from three prominent conservation organizations, a private forest landowner, leader of a local watershed association, three ecologists, a logger, a retired state agency official, and a private consulting forester. The decision was made not to include representation from state agencies, to avoid concerns over "turf" or interagency competition in the formulation of the vision. Public servants from the appropriate agencies would later be integral in the development of the subsequent comprehensive plan.

The team was charged with developing in a short period of time a vision that could subsequently be used by the secretary and his staff. The vision was to have two parts: a clear and simple expression of both the current situation and desired future conditions for the Massachusetts forested landscape; and a suite of possible recommendations to achieve that future condition. Due to the desire to avoid a belabored process and to simply develop a vision and concise recommendations rather than a comprehensive plan, the team met only twice, and communicated extensively online, sharing successive drafts. The process was completed in less than four months at negligible expense to the Commonwealth. The product was delivered to the Secretary of the Executive Office of Environmental Affairs in early March 2000, for his consideration and subsequent use.

CURRENT CONDITIONS OF MASSACHUSETTS FORESTS

Massachusetts is a forested land. In spite of the fact that it is the third most densely populated in the nation, roughly sixty-five percent of our state is wooded. In many communities, as much as eighty to ninety percent of the land is dominated by trees. Most of this forest has naturally returned following agricultural abandonment or other major disturbance. As a result, there is little very old or very young forest. Likewise, there are very few large blocks of forest not interrupted by roads or other human uses. This blanket of Massachusetts's forest extends beyond the borders of the Commonwealth, and makes us a part of a greater wooded northeastern region. Although forest land has increased in Massachusetts in the last century, the tide has turned and forest is being permanently lost to development — a symptom of our high population and relative affluence. The vast Massachusetts forest is vulnerable to this fate, since seventy-five percent of it is owned by hundreds of thousands of different private families and individuals. The average ownership is small (ca. ten acres), resulting in a vast patchwork quilt of many small pieces that collectively make up the greater forest we see each day. The individual and independent actions of these owners influence the fate of the forest that benefits the entire citizenry of the Commonwealth. This impressive landscape of trees

ensures a dependable supply of clean water; numerous opportunities for recreation and education; a source of cultural, historic, and spiritual inspiration; a buffer from increasing development; a diversity of flora and fauna; and a sustainable supply of wood products, on which we all depend. The woods of Massachusetts are an integral part of our daily lives, supplying invaluable benefits that we all, directly or indirectly, enjoy.

The steady urbanization of Massachusetts has resulted in a citizenry that lives predominantly in a developed environment, and is relatively unaware of the wealth of benefits provided by forests and the ways that careful stewardship can enhance those benefits. Management of forests is often considered incompatible with environmental protection by owners, and by the citizenry at large. Although wood is often harvested from many private lands, there is relatively little that is under long-term management. In the absence of such guidance and long-term perspective, harvesting can maximize short-term profit at the expense of future wood value production. Wood from Massachusetts's forests has great potential to more significantly meet local needs, contribute to local economies, and enter the global marketplace. Furthermore, forests and their future are not a high priority among key leadership in the public, private, and nonprofit sectors. Given the importance of forests, we have an acute paucity of information about its status and health upon which to make informed management and protection decisions. Cooperation among state and local agencies responsible for management and protection of forests is weak. There is almost no emphasis placed on the provision of advice, assistance, and encouragement to the population of private owners, on whose forest stewardship we all rely.

DESIRED FUTURE CONDITIONS

Massachusetts is a forested land. Woods are appreciated and protected from random, unplanned development by the strategic application of conservation restrictions on private land and acquisition by state, local, and private conservation organizations that all cooperate toward the same goal. Private and public forest fit together to form an integrated spatial network that continues to provide the impressive suite of benefits upon which we have all grown to depend. Such a network is widely recognized and supported by all residents, and indeed serves as a model of permanent forest benefits linked to the public, which is progressively recognized and emulated by other states and nations. Large blocks of forest are valued and protected for their biological and scenic benefits, as well as areas in which to focus wood production. There is a better overall balance of ages, structures, and conditions, with more younger and older woods, which provide a greater diversity of habitats. All native biotic elements and natural ecosystem processes are present and functioning at appropriate spatial and temporal scales. The wealth of social benefits is produced sustainably without degrading the ecological structure and function of the forest.

Forests are understood and appreciated by all to be critically important sources of the wealth of benefits. Woodland owners are well educated about the highest and best uses of their land, and with professional advice, make informed judicious decisions about its fate. Private owners are rewarded for the generous and sustainable provision of public benefits from their lands through supportive incentives for future stewardship. The state provides a leadership role in promoting the value of forests, both through its policies and actions on public lands. Public and private managers and owners cooperate across property boundaries in management and protection, while respecting ownership rights. Ecological and management information is shared freely between managers and owners thereby facilitating informed decisions about forest stewardship in a broader ecosystem, watershed, and habitat context. Municipalities, land trusts, and other organizations play a strong role in protecting and managing woodland. Such management is sensitive to ecological and cultural needs. Comprehensive and timely monitoring of forests provides managers, owners, and the public with current information with which to make wise decisions. Sustainable forest practices are applied on all lands that enhance their long-term value and stream of continuous benefits. With its wealth of forest, and enlightened approach toward its stewardship, Massachusetts is the envy of states and nations the world over.

RECOMMENDATIONS RANKED ACCORDING TO IMPORTANCE BY THE VISION TEAM

1. Aggressive forest protection via acquisition of conservation restrictions on private land, and fee acquisition where appropriate. Such land protection should occur strategically within a regional or landscape-level context, taking into consideration the pattern of existing public and private conservation lands. This effort should be a vehicle for the systematic conservation of biodiversity. Such land protection on the part of the state proceeds more flexibly, through multi-year projects, and with increased emphasis placed on the application of leaving land in private hands but with conservation restrictions to protect public interests. Work in partnership with the vast network of private nonprofit organizations to support local initiatives that have broad impacts and that attract matching dollars from private and foundation sources. This is

more cost effective and can hence reach more forestland in a shorter amount of time. Every public dollar devoted to forest protection can go farther and be more effective.

2. Authorize one or several large-scale planning and protection efforts with a diversity of public and private sector expertise to undertake the following activities:
   - Identify and map large forest areas.
   - Identify and map major wildlife and water protection corridors.
   - Identify and map ecological enhancement zones for transportation corridors.
   - Identify and map existing and cultural and nature recre-educational centers.
   - Identify and map recreational trails.
3. On the basis of the information gathered above,
   - Target land protection efforts in large forest areas, major corridors, and areas that are significant for biodiversity conservation.
   - Establish new cultural and nature recre-educational centers.
   - Identify ecological enhancement zones for transportation corridors.
   - Protect medium-sized patches of forest in local areas.
   - Establish trail systems to link regions and centers.
4. Evaluate and reorganize the bureaucratic structure of state agencies responsible for forest protection and management within the Commonwealth. The current structure and bureaucratic focus on game, forest management, water, and non-game/biodiversity perspectives is not conducive to the proactive and holistic attention that needs to be paid to forests, both those owned by the state, and those in private hands. The coordination of planning, land protection/acquisition, and management would be made more effective and comprehensive with a reorganized structure. Through a bureaucratic reorganization recommended above, place much greater emphasis on private owners of forestland — the owners of seventy-eight percent of the Commonwealth's forests.
5. Current-use property taxation is studied and greatly overhauled to make forestland ownership an attractive and effective alternative to private landowners, and to provide a significant reward for the stewardship of their land.
6. Training programs and other educational activities are designed to reach individuals and selected groups that are in a position to influence decisions regarding land development and the judicious care of Massachusetts's forests. Such target audiences include: private foresters; members and volunteers of local land trusts; conservation commissioners, planning board members, and other municipal officials; teachers; environmental educators; nonprofit groups that own land.
7. Commonwealth develops incentives that encourage groups of landowners and others to cooperate for the sake of:
   - Finding/creating additional markets for underutilized forest materials.
   - Focusing on value-added development and marketing of forest products.
   - Enhancing individual and collective economic and political impact.
   - Improving the development of locally based forest products, to reduce reliability on materials from outside our state and region.
8. The state undertakes a comprehensive forest policy overview, with the goal of consolidating and streamlining the various statutes and regulations that influence forests. For example, Chapter 132, the Forest Cutting Practices Act, and/or its appropriate regulations, is reviewed and amended to discourage highgrading, and clarify landowner recognition and willful participation in such activity on their lands.
9. Creation of an EOEA Secretary's Forest Council, to advise the EOEA Secretariat on matters of importance to forests. The Council would be comprised of representatives of forest ownership, forest industry, environmental organizations, conservation biologists and other appropriate scientists, and others. It would be independent of the various state agencies, though it would frequently seek information from appropriate state agencies.
10. Establish a mechanism for ensuring regular updates of ecological and socioeconomic spatial and other data. Specifically, establish a schedule for regular and frequent updating of satellite and air photo imagery for the entire state, and use these data to update land-use coverage on a frequent basis, to assist land protection and acquisition efforts, ongoing management, and planning.
11. A task force is created to investigate a means by which significant and consistently sustainable and specifically dedicated funds can be generated and invested in public and private Massachusetts forests, for the benefit of all citizens. Possible sources of such funds include:
    - Timber sale proceeds from state lands.
    - Fees based on consumption of gasoline, home

heating oil and gas, electricity or other uses of carbon, which forests effectively sequester.
- Fees on water consumption, which depend on healthy forested landscapes.
- Fees on rooms and meals that benefit from attractive forested landscapes.
- Fees on ammunition, weapons, binoculars, bird feeders, and other means by which wildlife are enjoyed throughout Massachusetts.

12. The Commonwealth develops incentives for the new and creative use of wood for such products as: co-generating power plants that use wood and polymer-wood based materials as a fuels. Such uses of wood will enhance local economies, increase returns from forest management to private owners, and reduce our reliance on other regions to supply our material and energy needs.
13. The Commonwealth invests in the development, pilot testing, and continued operation of a Knowledge Management System for Massachusetts forests: a comprehensive database that provides up-to-date and easily accessible information on all aspects of Massachusetts forests on the Internet. When fully operational, this Web site should be able to respond to inquiries from a wide variety of individuals and organizations with diverse levels of sophistication, and be accompanied by effective mechanisms and incentives for collecting and maintaining a current and all-inclusive base of information on forestland.
14. State studies the feasibility and creation of financial rewards or incentives for the following:
    - development/protection of municipal forests;
    - private forest owners who supply public benefits;
    - providers of local value-added wood and other forest products that will enhance returns to private owners and local economies.
15. The Commonwealth develops incentives for the provision of such valuable forest ecosystem services as:
    - carbon sequestration/ air quality;
    - recreation;
    - planning and zoning;
    - water supply protection;
    - tourism; and
    - the protection of state-listed species.
16. Establish a network of adaptive management areas on state lands to serve as focal areas for testing innovative research and management approaches. The management of these forests will incorporate, where practicable, the restoration and maintenance of indigenous biodiversity and ecosystem processes. Managers of public land will incorporate current research results and the latest scientific knowledge into all their management planning and decision making, and remain current on the latest research findings. They will communicate their research needs to the scientific community and will be eager recipients/users of scientifically derived information that may pertain to their management.
17. Create a system of Forest Networks: integrated information-exchange networks as voluntary points of information/advice/technical assistance, or "one-stop shopping" for information on:
    - forest management;
    - land protection;
    - wood products marketing;
    - recreation opportunities;
    - general forest information;
    - forest health;
    - biodiversity;
    - forest-related enterprises;
    - forest monitoring results.

    Audiences relying on this suite of information include:
    - forest owners;
    - professional forest managers;
    - participants in the wood industry;
    - members of the media;
    - educators;
    - citizens;
    - recreators;
    - investors;
    - municipal planners;
    - land trusts.

    The Forest Network would use the Knowledge Management System (described above, 13), as well as a cadre of Forest Networkers affiliated with each watershed, whose job it would be to:
    - convene meetings of landowners;
    - respond to requests for information;
    - serve as catalysts or facilitators to knit together groups and individuals with forest concerns or opportunities for cooperation;
    - constantly solicit feedback and information from forest audiences;
    - serve as technical "circuit-riders" to assist communities and land trusts with forest-related questions and issues;
    - establish a network of demonstration areas within the watershed to serve as excellent examples for a wide variety of audiences.
18. The Commonwealth stimulates the economic

potential of wood from Massachusetts forests by providing incentives to the wood-using industry to use native raw materials, thereby reducing the amount of raw wood materials that are exported from Massachusetts.

19. Establish a network of long-term ecological monitoring sites across the state and implement a program for monitoring and research at each site. Such data would provide an ongoing indication of the overall extent of forest, its distribution, its structure/composition, ownership and protection status, and health/vigor.
20. Establish a databank to make available to any and all interested parties the results of monitoring and land-use updates. Such information would be of great use to individual, municipal, and other planning efforts.
21. The Commonwealth stimulates the economic potential of non-wood-based forest products, such as greens, mushrooms, berries, nuts, herbs, recreational opportunities, and other forest nurture-based business enterprises.

SOURCE

Foster, C. H. W., and D. R. Foster. 1999. *Thinking in Forest Time: A Strategy for the Massachusetts Forest.* Harvard Forest paper no. 24. Harvard University. Petersham, Massachusetts.

USING FOREST CONSERVATION EASEMENTS PROACTIVELY TO ENCOURAGE STEWARDSHIP

Keith Ross

Author contact information:
Keith Ross,
LandVest, Senior Advisor
5 Chestnut Hill
Warwick, Mass. 01378
email: kross@landvest.com

HISTORICAL BACKGROUND

Conservation easements, known in Massachusetts as conservation restrictions, have been in use in New England for over 100 years. The first conservation easement in New England was written in the 1880s to protect the parkways in and around Boston, which were designed by Frederick Law Olmsted.

Today conservation easements are the fastest growing method of protecting land in the U.S., with more than three million acres protected around the country using this conservation tool. Currently, the most effective use of conservation easements is to prevent the subdivision and development of the property into industrial, commercial or residential use. This has translated into no building, no mining, no dumping, no paving. It is a relatively simple concept to understand, monitor, and enforce. The properties protected started out on the small side, less than 100 acres, but the size of the properties protected has grown as the tool has been applied to agricultural lands, range lands, and now forest lands. Today there are conservation easements in use on forestlands as large as 762,000 acres and rangelands nearly as large.

The use of conservation easements as a land protection tool has increased for a number of reasons, including:

- the rapidly expanding number of nonprofit land trusts qualified to hold conservation easements;
- decreased public funding available for in-fee acquisition;
- increased acceptance of the tool by public conservation agencies in charge of forests and parks, fish and wildlife, and drinking water supplies;
- favorable state and federal tax treatment of easements for individuals;
- flexibility of the documents to accommodate a variety of landowners' interests;
- increased understanding and acceptance by private landowners; and
- increased funding for the purchase of conservation easements, from both public sources ($5.7 billion nationwide in 2002 alone) and private philanthropy.

Early conservation easement documents have changed in innovative ways, to adapt to larger landscapes and land-use areas that are more difficult to describe and to monitor cost-effectively. Recent proposals to extend the Green Mountain National Forest boundary into western Massachusetts have increased the interest in conservation easements because there are many who would support the boundary extension only if the primary method of resource protection were conservation easements, rather than in-fee ownership.

The Commonwealth has demonstrated its interest in the forests of western Massachusetts through a variety of legislative actions. Beyond the statutes permitting property taxation at current-use value for forestry or farming (Chapters 61, 61A, and 61B), is the Reforestation Act of 1908. This act demonstrated the Commonwealth's interest in private forestland management by setting up a process to purchase private lands for reforestation purposes. The act also included a provision allowing sellers to redeem their lands by paying back to the state the purchase amount plus the value of any improvements plus interest, and by accepting a deed restriction prohibiting the harvest of trees under eight inches. This deed reservation was an early attempt to influence the stewardship of forests held by private landowners.

LEGAL DEFINITIONS AND BACKGROUND

A conservation easement is a legal agreement a property owner makes with a qualified conservation easement holder to restrict the type and amount of development that may take place on his or her property. Each easement's restric-

tions are tailored to the particular property and to the interests of the individual owner.

To understand the easement concept, think of owning land as holding a bundle of rights. A landowner may sell or give away the whole bundle, or just one or two of those rights. These may include, for example, the right to construct buildings, to subdivide the land, to restrict access, or to harvest timber. To give away certain rights while retaining others, a property owner grants an easement to a qualified third party.

The specific rights a property owner forgoes when granting a conservation easement are spelled out in each easement document. The owner and the prospective easement holder identify the rights and restrictions on use that are necessary to protect the property — what can and cannot be done to it. The owner then conveys the right to enforce those restrictions to a qualified conservation easement recipient, such as a public agency or a land trust.

In Massachusetts, a conservation restriction, also known as a conservation easement, is authorized under Sections 31-33 of Chapter 184 of the General Laws of the Commonwealth as a means to limit the use of land in order to protect specified conservation values, including the land's natural, scenic or open condition. Conservation easements must be submitted according to the written procedures of and approved by the Secretary of Environmental Affairs. Conservation easements held by nonprofits also require the approval of the town within which the land is located, in addition to the Secretary's approval. In the case of conservation easements to be held by the Commonwealth, only the Secretary's approval is required and the town within which the easement is located only receives a notice of such action by the Commonwealth.

The holder of a conservation easement must have a commitment to carry out the conservation purposes of the easement and have the resources to enforce the restrictions. Likely holders are governmental units that meet the above commitment, and nonprofit land trusts with the federal 501(c)(3) tax status that meet the public support test of section 509(a)(2). Section 509(a)(2) of the Code of Federal Regulations separates privately operating 501(c)(3) nonprofits, which receive most of their funds from one person or source, from publicly supported 501(c)(3) nonprofits, which receive at least one-third of their annual support from the public.

Near the beginning of a conservation easement document, usually under a heading, "The Purpose" goals, generally in line with the Internal Revenue Code Section 170(h)(4)(A), are listed which define conservation purposes for federal tax-deductibility. They are:

(i) the preservation of land areas for outdoor recreation by, or for the education of, the general public;
(ii) the protection of a relatively natural habitat of fish, wildlife, or plants, or similar ecosystem;
(iii) the preservation of open space (including farmland and forestland) where such preservation is:
  (I) for the scenic enjoyment of the general public; or
  (II) pursuant to a clearly delineated federal, state, or local governmental conservation policy; and will yield a significant public benefit; or
(iv) the preservation of an historically important land area or a certified historic structure.

The Purpose clause is used to define the values to be protected in the conservation easement. A reasonable specific purpose clause may help provide guidance if, at some point in the future, a court or a party is called upon to determine exactly what the grantor was trying to protect with this particular deed of easement.

Conservation easements are flexible documents compared to a full-fee deed. A landowner can tailor a conservation easement to his or her personal conservation interests in the land being protected. Of special interest to many landowners is retaining ownership of the land, but ensuring that once their ownership ceases, the next owner will be prohibited from altering the property in violation of the restrictions contained in the conservation easement document. Many rural communities in Massachusetts have benefited from long-term family ownership of forestlands in the western part of the Commonwealth. For many communities, large blocks of undeveloped land provide the backbone to property tax revenues, because they always bring in, in taxes, more dollars than they absorb, in public spending or services. Conserving significant blocks of open land with easements keeps those lands on the property tax rolls and supports rural communities. In addition conservation easements are compatible with Chapter 61, 61A and 61B, the Massachusetts current-use property tax programs.

Term conservation easements, which are established for a defined period of time rather than in perpetuity, can reduce acquisition costs further, but expire at the end of the defined period of time.

When determining whether fee purchase of conservation easement purchase is the best method, several questions need to be considered. These include:

- What are the conservation values that are trying to be protected with this new proposal?
- Can they best be accomplished by using fee acquisition rather than conservation easement?
- Is there a mix of fee and easement that can cost-

effectively accomplish the primary conservation goals for the region?
- Are these conservation goals developed at a national scale and implemented at a local scale?

If the primary goal, for example, is restoring the wilderness characteristics of the region, then fee ownership might be the best method. Or if the primary goal is to support the local natural resource-based economy, direct development to those areas better suited, and support private stewardship and their efforts toward sustainable management, then conservation easements might be the best choice. In many situations, a mix of both conservation easement and fee ownerships probably would work best.

CURRENT EASEMENT USES

Conservation easements are widely seen as a very flexible tool for conservation, especially when the most significant threat is conversion of land to incompatible uses, or fragmentation of ownership. In most cases, conservation easements are a cost-effective method of achieving resource protection. Conservation easements cost less initially to purchase from landowners than full fee landownership. Long-term stewardship costs, such as annual property taxes or road and boundary maintenance, remain the responsibility of the landowner, rather than fall to a cash-strapped public agency. Partnerships with nonprofits can help to reduce the stewardship expenses that public agencies might otherwise have for monitoring conservation easements, and also offer private landowners a choice among potential easement holders. The land remains in private ownership and thus remains on local property tax rolls.

The expansion of the conservation easement tool has led to a variety of innovative strategies to provide additional guidance for private stewards in meeting broader resource management goals. Discussed below are a few areas that I believe offer the greatest opportunity to expand conservation easements beyond limiting development or conversion of land to new uses. Encouragement of sustainable forestry and improved stewardship of forest resources are important steps for the majority of private forest landowners in the Commonwealth.

Management Planning

Many land trusts and state agencies now require stewardship plans for lands subject to conservation easements. In the case of working forest easements, these stewardship plans are generally ten-year forest management plans that detail the current conditions of the forest, expected rates of growth, and harvesting recommendations. Additional information and considerations in a management plan can include wildlife habitat, cultural and geologic features, public access uses and scenic vistas, and proximity of other protected lands. The management of these areas, and associated buffers, may require special management and unique operating procedures. The management plan is a required expense for the landowner. In some cases the easement holder will either review the plan and/or approve the plan. More recently, some conservation easements have required the landowner's professional forester to "certify in writing" that the forest management plan meets the terms of the conservation easement. Most forest management plans recommend stewardship actions to be undertaken on the property. Many include protection, that go beyond existing state law, for special habitats, riparian zones, old-growth areas, and buffer areas for each of these.

Efforts to include in working forest conservation easements requirements that landowners maintain forest management plans are generally accepted. Yet requirements that the easement holder approve these plans has proven difficult for landownerships in the thousands of acres. The concerns of large-acreage landowners with this requirement are centered on disagreements over management direction, and the time and cost associated with resolving these disputes.

Integrating individual forest and farm management plans into a larger management plan for an entire region would be a formidable task to accomplish, but could prove to be the cornerstone for ensuring the success of a national forest established predominantly through conservation easements rather than fee purchases. Advances in Geographic Information Systems (GIS) technology and in aerial or satellite imaging provide some critical tools to assist landowners in not only in determining the current conditions of their properties, but in forecasting the implications of cumulative actions. The management planning process could be a very powerful tool to illustrate for individual landowners the potential impacts of their forest management choices on a broader region, especially in the areas of water quantity and quality, the availability of wildlife habitat and movement corridors, forest succession and cover types, and availability of forest products for local industries.

Connections with Landowners

Conservation easements provide a permanent connection between the easement holder and the landowner. That connection provides the opportunity to meet on a regular basis, to exchange information about new advances in resource management, information about where the property fits in a regional context, and access to training opportunities. Several organizations use this connection to deliver information in a newsletter or through Web sites. The annual

meeting with the landowner is a key opportunity to influence management activities, to address cumulative impacts of management activities on a regional basis, and to learn from the landowner what actually works and doesn't work on the ground, and therefore is an important avenue to better stewardship in the long term. A few land trusts are using this permanent connection to offer landowners opportunities to participate in discussion groups on regional management issues such as cooperatives for the sale of forest products, access to low-cost management services, habitat requirements of native wildlife species, tax information, and identification and management of invasive species.

Using this connection to encourage activities that advance stewardship goals for the larger region could be another key to the successful implementation of a new type of national forest in western Massachusetts. For example, assume that the regional forest management plan called for up to ten percent of the area to be in old-growth forest, with specific amounts of acreages in various forest types. Incentives could be offered to encourage the owners of lands subject to permanent conservation easements to designate portions of their lands to meet this ten percent goal. Incentives could include grants to pay annual property taxes and/or to pay for income lost through no-harvesting provisions. Perhaps the regional plan will call for fifteen percent of the region's forest to be in the early stages of forest succession. Landowners with lands subject to conservation easements who need additional cash to cover unforeseen expenses, such as hospital care, could received support for clear-cutting portions of their land through grants for erosion control, tree planting, or conversion of forest cover types to more site-appropriate native species.

The possibilities for discussion groups to facilitate local secondary manufacturing and use of forest products harvesting and marketing are substantial. Web sites established to give qualified buyers advance notice of anticipated harvesting, the types of products to be harvested, and the location of these products can encourage and support local mills and secondary manufacturers. Such Web sites could also be used by potential buyers of finished products for local and regional construction projects and consumer products, to identify sources of supply that could meet their anticipated needs.

Public Access

The right of the public to have access over land that is subject to conservation easements is not uniform. While some easements provide for such access, most easements held by land trusts do not permit public access. In contrast, most though not all easements held by public agencies, both state and federal, permit some level of public access, either broadly or over a specific set of trail corridors and at certain times. National forests are recognized by most as open to the public, and it will be important to ensure that a new national forest continue in that tradition. There is no doubt that as more and more people fill the landscape, the opportunities for nearby access to the quiet enjoyment of the forest become less and less available.

A program of purchasing conservation easements on private lands in western Massachusetts will need to consider a variety of options to meet the need for public access. For many private landowners, public access to their land has not been an issue. They freely allow the public to hunt and fish and enjoy hiking over much of their property. For some, public access is a significant violation of their privacy, and requiring public access would be an impediment to their participation in any publicly funded program. Changing the equation of "public dollars for public benefit" to "public dollars for public access" has driven many private landowners away from public funding. This has a greater impact in rural areas than in suburban areas. Being able to offer easement language that varies, from purchasing broad access at any time of the year to purchasing only access to limited trails at certain times of the year, will be important. In addition, allowing landowners the freedom to close trails during harvesting, or other activities that might prove dangerous to either people or the environment, is also key.

Motorized access in most cases will need to be on publicly owned land, either state or federal, to ensure that appropriate land management measures can be instituted. Opportunities for these recreation choices could be found on privately owned land, but conservation easements may not be the best vehicle to accomplish these necessary resource protection goals.

Additional Restrictions

The recent experience of several nonprofits and public agencies in using conservation easements to go beyond restricting actions to requiring actions have met with mixed results:

> Requirements in a conservation easement in Vermont that require the landowner to harvest timber when the forest reaches a determined age have met mixed reactions. Several conservation groups have been very outspoken in opposing such requirements. Yet these same groups have no problem with conservation easements that forever prohibit timber harvesting.
>
> Requirements for specific basal area levels according to forest type in working forest easements, or approval for each and every action within the forest plan, may be vague or difficult to monitor.

Requirements that landowners keep fields mowed, or that require a landowner to take some other type of action, are also very difficult to enforce. Stopping a landowner from taking an action has a remedy in law, but requiring a landowner to take an action is much more problematic and harder for courts to enforce.

Since the early 1990s the Massachusetts Agricultural Preservation Restriction program has included in their easements a right of first refusal. This ensures that the state can purchase farmland protected by an agricultural easement, if a potential buyer surfaces who fails to commit to continuing agricultural use, and who can afford to own sixty acres of yard rather than row crops. This Option to Purchase at Agricultural value is an example that could have merit if the objective is to ensure that a certain type of management continues through successive owners. For example, where there is an interest within a broad region to ensure management of forest resources to support ecological integrity as well as economic sustainability, conservation easements could include an option of first refusal for the easement-purchasing agency to purchase a property under conservation easement, if that property was otherwise to be sold to someone who intended to engage in a form of forest management that was incompatible with regional forest management goals. This right could also be assigned by the agency to a buyer who would agree to continue the previous form of forest management.

Conservation Easement Monitoring

Probably one of the most important considerations in any conservation easement is how it will be monitored over time. How often will the property need to be visited to ensure compliance with the terms of the document? Advances in aerial and satellite imagery are quickly making landscape-scale monitoring possible. Provided that the goals of the easement can be monitored in a broad manner, the existing technology is both cost-effective and accurate. Computer programs can now analyze the light bands in three photographs taken of the same area, at three different times, to locate areas where change has taken place. Reference to digitized forest management plans can then identify if those changes were planned or not. Site visits can be pinpointed to make on-the-ground monitoring more cost-effective, and ensure that what was planned did in fact happen, by visiting the unplanned disturbances first, then sampling a portion of the planned disturbances. Over time, the interpretation of the light bands can be refined based on on-the-ground tracking, to establish greater levels of accuracy.

This type of long-range, broad-level monitoring, coupled with the existing activities of state foresters who monitor Chapter 132 cutting plans and partnerships with land trusts, can form a strong base for ensuring conservation easement compliance.

A NATIONAL FOREST FOR WESTERN MASSACHUSETTS?

Converting private ownership into public ownership for the purpose of protecting natural resources may not be the best choice for western Massachusetts. Western Massachusetts is much more suited to the use of conservation easements in partnership with private landowners, for several reasons.

1. Conservation organizations such as the Berkshire Natural Resources Council, Williamstown Rural Lands Foundation, Franklin Land Trust, Hilltown Land Trust, Trustees of Reservations, New England Forestry Foundation, Massachusetts Audubon Society, The Nature Conservancy and local conservation commissions have been involved in conservation easements in the region for over 30 years. These nonprofits, and others, need to be engaged in the process and be offered the opportunity to provide technical skills to the purchasing agency to ensure good landowner communication, and cost-effective monitoring of easement lands.
2. The recent program by the Mount Grace Land Conservation Trust and the Massachusetts Executive Office of Environmental Affairs in the North Quabbin Region completed 100 conservation easement transactions in two years, and protected nearly 9,000 acres. This illustrates the public's interest and acceptance of this conservation tool, and can provide a base of experience that can be adapted to another region of the state.
3. Local residents have a strong distaste for public ownership in-fee because of the loss of property tax income, loss of local control over land management issues, and loss of local forest-related jobs. These questions would need to be addressed up front. Limiting fee ownership to a small part of the program, for those areas that will have intense public use or where potential liability is high, could lessen fears of a federal takeover.
4. A unique conservation easement purchase program could incorporate stewardship incentives for the landowners, such as:
   - participation in a regionwide forest-management planning process;
   - individualized plans for each owner's land;

- facilitated discussions of natural resource issues, both online and in person;
- access to funds for special management practices on their lands;
- assistance with marketing and sales of forest products, providers of forest management services, and third-party certification;
- rights of first refusal for subsequent sales outside of the family.

Funding

The major assumption associated with this paper is that the federal government will be providing the majority of funds to purchase conservation easements in western Massachusetts. Given that ninety-five percent of the Forest Service budget is committed to the national forest system and only five percent goes to forest research and private land management, there has long been a need for recognition of the values private lands bring to this nation, and for support of private stewards' efforts to manage their land sustainably. Establishing a national forest on land that is primarily privately owned, with only key areas of high public use in public ownership, would permit that new national forest to compete on an annual basis with the other forty-four national forests seeking a portion of that ninety-five percent of the U.S. Forest Service budget. If the privately owned land were protected with conservation easements, which permitted some level of public access and required forest stewardship plans that addressed not only the subject forest but stewardship issues for the larger forested area as a whole, a variety of innovative approaches could evolve.

Partnerships with private nonprofits and foundations can be built to assist landowners for whom a publicly funded easement does not work. A matrix of options can be established for landowners, setting a first threshold of no development and sustainable forestry, but with increasing access to additional programs for private landowners who participate in management planning, discussion groups, and right-of-first-refusal options. Nonprofits and foundations could bring a lot to the table and become recognized partners in the program for monitoring as well as initial acquisitions.

Endowments for monitoring conservation easements will need to be established with a portion of the acquisition funds for each easement purchased. Such endowments will ensure that funds will always be available to enforce easements in case of violations. To ensure that neither the federal nor state legislatures have the ability to invade these funds, several donor-designated funds could be established within regional community foundations, to invest and steward these dollars.

Forest Legacy Program

One of the major differences between the Forest Legacy program as it now works, and the proposal for a national forest in western Massachusetts that spawned this endeavor, is the stewardship opportunities for lands subject to conservation easements. Under the existing Forest Legacy program, monitoring of the easement and communication on stewardship issues is through the local land trust that sponsored each landowner's application to the program. Legacy operates through a series of Memorandums of Understanding between the federal government and the Commonwealth of Massachusetts, and then between the Commonwealth and the local land trust, which assign responsibility for specific aspects of monitoring. Ultimate enforcement authority lies with the Commonwealth and then the federal government, should the Commonwealth fail to act appropriately.

The most recent state grant program final guidelines published for the Forest Legacy program (dated June 30, 2003) state that lands and interests in lands located within a Forest Legacy Area and simultaneously within other federal boundaries (e.g. national forest, national park, or national wildlife refuge) are eligible for the Forest Legacy program, provided that the responsible federal agency concurs with state acquisition under the program. Forest Legacy funds cannot be used for federal acquisition of lands located within a national forest boundary.

CONCLUSION

I would suggest that conservation easements are an important tool for a cooperative approach to natural resource protection. Easement documents are flexible and can allow for a variety of land uses. The relationship of landowner and easement holder can be designed to achieve effective and responsible stewardship goals. The ability of the easement holder to bring to the annual review meeting new technological advances in harvesting methods, new information about biological processes, and information on the cumulative impacts of actions of other landowners in the area can be matched by the landowner's feedback on what works and what doesn't work in the field, in the market, and in the long run. This two-way communication is permanent as long as the conservation easement is in place and is the foundation for better stewardship dialogue.

When people are responsible for the care and maintenance of natural resources that benefit others, they do a better job if we ask them, "How can we help?" rather than, "Let me take over." Rewarding private stewards for doing something for all of us, rather than taxing them into uses that destroy the forest, fosters a better stewardship ethic. If successive generations of Americans are excluded from the important tasks associated with stewardship of natural

resources, how can future generations understand their significance and learn the methods?

To summarize in terms of four broad areas:

Needs & Goals:

- accommodate diverse landowner interests (by negotiating easements individually);
- recognize landowner needs (for some capital return from land);
- respect private property while providing for public access and public goods, including recreation;
- ensure future timber harvesting or other specific management activities (though this is difficult to negotiate or enforce over time);
- prevent further fragmentation and land-use conversion;
- stretch public dollars.

Spatial Scale & Locus of Control:

- public interests are owned by the public (through local, state, or national nonprofits; or through local, state, or federal governments);
- some interest is still controlled locally and privately;
- easements can be applied incrementally, with no minimum or maximum scale.

Temporal Scale:

- in perpetuity.

Methods:

- potentially temporary public ownership (as envisioned under the Massachusetts Reforestation Act of 1908);
- rights of first refusal for public ownership;
- tax and other incentives for conservation (through the federal income tax code, and local property taxation);
- planning: both individual stewardship plans (required under Massachusetts Chapters 61, 61A, and 61B) and regional resource or landscape management/stewardship plans (which might be advisory rather than binding);
- persuasion, education, and capacity building for co-management, through long-term relationships between landowners and easement holders;
- GIS and other technologies (including the Web or Internet) for enforcement, monitoring, planning, and education.

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SHARED LAND PLANNING AND MANAGEMENT IN MASSACHUSETTS WITH THE NATIONAL PARK SERVICE, U.S. FISH AND WILDLIFE SERVICE, AND PUBLIC-PRIVATE PARTNERSHIPS

Rob Moir

Author contact information:
Rob Moir,
Office of Institutional Advancement
Hampshire College
Amherst, Mass. 01002
email: rbmDV@hampshire.edu

INTRODUCTION

This paper discusses three federal efforts to manage lands in Massachusetts through partnerships with local residents. The Silvio O. Conte National Fish and Wildlife Refuge, the Quinebaug and Shetucket Rivers Valley National Heritage Corridor, and the Boston Harbor Islands National Park Area all demonstrate how federal officials coordinate, facilitate, and direct — through either consensus or science expertise — responsible resource management with local, municipal, and state agencies, and with private landowners. At the end of each section some implications for the forestlands of Massachusetts are considered. An approach is proposed in a fourth section that is more private and less public.

Before looking at national parks and national wildlife refuges, it is important to recall how the demand for public natural resource management began, in response to privatization gone rampant. This resulted in what Frederick Law Olmsted called in 1864 "a trust from the whole nation."[1]

The tension for a national park was first felt in the Northeast. America's preeminent natural wonder during the first half of the nineteenth century was Niagara Falls. Niagara Falls became a destination for tourists when railroads connected urban centers, such as New York City and Boston, with the natural attraction. By 1850, travelers to Niagara Falls found tawdry concessions and souvenirs, filth, and squalor. To view the infamous falls, one was charged by local landowners to look through a hole in a fence at the awesome spectacle while others clamored behind for their turn. Public outcry at the frenzied activities of local individuals maximizing profits raised national questions. Government control of natural areas and natural wonders would not only assure public access, but it would also substantially improve the experience for visitors. When the specter of privatization at its worst threatened Yosemite, Congress was prepared to act.

In 1851, Major James Savage led the Mariposa Battalion in pursuit of "intransigent" Indians into Yosemite Valley. Within a few years land claims were filled out for the valley lands. The first tourists arrived in 1856. They were charged tolls for entry and viewing; a building spree of houses and concessions began; the Lower Hotel opened in 1856; and plans were drawn up to dynamite the spectacular granite face of El Capitan to provide stones for building a hotel in the valley. In 1864, Congress, concerned about the availability and preservation of Yosemite for all visitors, withdrew the valley from private ownership and turned it over to the state of California as a public park. Included in the transfer to the state was also a nearby grove of giant sequoias, the Mariposa Big Tree Grove.[2]

The great landscape architect, Frederick Law Olmsted, visited the new park and submitted an eloquent report to the governor of California in 1865.[3] He began his report with the current events of the time, notably the Civil War, moved quickly to the dangers of private ownership of national treasures, and commended Congress for its foresight and forthright action under the circumstances:

> It was during one of the darkest hours, before Sherman had begun the march upon Atlanta or Grant his terrible movement through the Wilderness, when the paintings of Bierstadt and the photographs of Watkins, both productions of the war time, had given to the people on the Atlantic some idea of the sublimity of the Yosemite, and of the stateliness of the neighboring Sequoia grove, that consideration was first given to the danger that such scenes might become private property and through the false taste, the caprice or the requirements of some industrial speculation of their holders, their value to posterity be injured. To secure them against this danger Congress passed an act providing that the premises should be segregated from the

general domain of the public lands, and devoted forever to popular resort and recreation, under the administration of a Board of Commissioners, to serve without pecuniary compensation, to be appointed by the Executive of the State of California. (Olmsted 1865)

Olmsted proposed that four of the eight Commissioners be appointed annually, and "that these four shall be students of natural science or landscape artists." After briefly describing many of the park's sublime wonders, Olmsted admonished the governor that Yosemite was much more than a "pleasuring ground." The contemplation of natural wonders and scenic landscapes made Yosemite an encampment for the betterment of health, spirit, and intellect of democratic citizens "which rest on the same eternal base of equity and benevolence with all other duties of republican government."

In the quotation from his 1865 report below, Olmsted draws attention to more than those citizens who can afford to go to Yosemite. Reporting on a western park, he sounds much like writers promoting the need for urban parks, writers like Bostonian Charles Eliot (1902–2000), who came a generation later:[4]

> It is a scientific fact that the occasional contemplation of natural scenes of an impressive character, particularly if this contemplation occurs in connection with relief from ordinary cares, change of air and change of habits, is favorable to the health and vigor of their intellect beyond any other conditions which can be offered them, that it not only gives pleasure for the time being but increases the subsequent capacity for happiness and the means of securing happiness. The want of such occasional recreation where men and women are habitually pressed by their business or household cares often results in a class of disorders the characteristic quality of which is mental disability . . . incapacitating the subject for the proper exercise of the intellectual and moral forces. . . [I]n this country at least it is not those who have the most important responsibilities in state affairs or in commerce, who suffer most from the lack of recreation; women suffer more than men, and the agricultural class is more largely represented in our insane asylums than the professional, and for this, and other reasons, it is these classes to which the opportunity for such recreation is the greatest blessing. . . Few persons can see such scenery as that of Yosemite and not be impressed by it in some slight degree. All not alike, all not perhaps consciously, and amongst all who are consciously impressed by it, few can give the least expression of that of which they are conscious. But there can be no doubt that all have this susceptibility, though with some it is much more dull and confused than with others.
>
> For the same reason that the water of rivers should be guarded against private appropriation and the use of it for the purpose of navigation and otherwise protected against obstruction, portions of natural scenery may therefore properly be guarded and cared for by government. To simply reserve them from monopoly by individuals, however, it will be obvious, is not all that is necessary. It is necessary that they should be laid open to the use of the body of the people.[5] (Olmsted 1865)

A founding purpose of the nation's first national park was to preserve a small forest, "the stateliness of the neighboring Sequoia grove." In the forests of Massachusetts it is easy to hear the words of Olmsted once again: "Few persons can see such scenery . . . and not be impressed by it in some slight degree." The question becomes how might the National Park Service or the National Wildlife Refuge System participate and collaborate with private interests in the peopled forests of Massachusetts? Would federal involvement further forest conservation and restoration, promote forestry at a small scale as a traditional industry, and preserve ecological diversity, or would forests only "be laid open to the use of the body of the people?"

SILVIO O. CONTE NATIONAL FISH AND WILDLIFE REFUGE

The Silvio O. Conte National Fish and Wildlife Refuge Act (P.L. 102-212) was signed into law in 1991 by President Bush. The U.S. Fish and Wildlife Service was charged with studying the entire 7.2 million acres in the Connecticut River watershed and creating a new national fish and wildlife refuge. The refuge is named for the late Massachusetts congressional representative and conservationist, Silvio O. Conte. The Conte Refuge is one of more than 530 refuges in the 93-million-acre National Wildlife Refuge system. The U.S. Fish and Wildlife Service manages the system as part of its mission to conserve, protect, and enhance the nation's fish, wildlife, plants, and their habitats for the continuing benefit of people.[6]

The Conte Refuge is unique among National Fish and Wildlife Refuges for its mandate to conserve, protect, and enhance fish and wildlife in a watershed that is larger and more heavily populated than other refuges. The Conte Refuge is only one of three national refuges responsible for both fish and wildlife. Most refuges are charged with managing wildlife in more terrestrial ecosystems.

Protecting natural diversity is a new scientific and social challenge for the Fish and Wildlife Service. The Conte Refuge staff recognizes that this challenge requires a

new approach that involves the people of the watershed, especially landowners and land managers, in environmental education programs and cooperative management projects. This vision statement presented in a two-page handout titled No Ordinary Refuge makes clear the intention to forge a collaborative model for refuges of the future:

The health and integrity of the watershed's many native species, habitats and ecosystems must depend on the vigilance of an educated citizenry that holds natural diversity conservation a high priority and recognizes and actively solves local problems. Our vision is that we can help guide and support citizens of the watershed in this endeavor. Assisted by our leadership, the citizens of this watershed will act wisely to preserve, undiminished, the wide diversity of healthy habitats and the abundance of native species that characterize this watershed. They will be able to continue to enjoy the special nature of the New England landscape, and pass this distinctive legacy on to their children, their grandchildren, and their great-grandchildren.[7]

Some of the objectives the Conte Refuge tries to accomplish are:

1. Prevent further loss of populations of threatened or endangered species.
2. Stabilize or increase populations of rare or declining species.
3. Protect representative examples of all natural community types.
4. Protect and properly manage habitats within a Special Focus Area and small, scattered sites of critical importance to a single rare species or rare natural community type.
5. Ensure adequate suitable habitat remains available to sustain current numbers of all migratory songbirds into the future.
6. Restore migratory pathways for fish (access to historic and suitable spawning habitats).
7. Protect water quality in "riparian" Special Focus Areas.
8. Improve wildlife habitat management on open land to benefit rare species and compensate for wildlife losses due to continuing development on other lands.
9. Prevent habitat degradation caused by invasive exotic species.
10. Educate citizens who will actively protect the natural resources in their communities.[8]

The Conte Refuge staff accomplishes much through modest challenge and matching grants. Grants average less than $4,000, with few over $10,000.[9] Individuals (researchers and landowners), citizen groups, businesses, and organizations, including schools, apply for the Refuge's Challenge Cost Share Program and other matched grants funds within each of the ten objectives listed above. For example, under Objective 1 the Massachusetts Division of Fish and Wildlife Natural Heritage Program was awarded funds for a freshwater mussel inventory; under Objective 3 a researcher received matching funds for identification of Acadian flycather nesting habitat at Quabbin Reservoir; under Objective 10 the Old Lyme Conservation Trust received support for one-fifth the cost of Special Focus Area interpretive signs. Only about five percent of matching funds are awarded to private landowners.

The Final Environmental Impact Statement (FEIS) has identified forty-eight Special Focus Areas. Conte Refuge staff identified areas providing habitats for federally listed species, rare species, fisheries (accounting for twenty of the forty-eight), waterbirds, and migratory landbirds. Also identified were wetlands, contiguous habitats, and unusual habitats. Work continues on identifying small scattered sites for rare species and communities, as well as research on nesting and stopover habitats for songbirds. Recommendations to add more Special Focus Areas are expected. Adding Special Focus Areas would require an Environmental Assessment.

Land acquisition is often not the appropriate solution in many Special Focus Areas. In Massachusetts, the few Special Focus Areas suitable for priority land acquisition are Mt. Tom/Mill River/Mt. Holyoke Range and Montague Plains. Challenge Cost Share projects within Special Focus Areas receive priority over similar requests outside designated areas.

Nearly all of the 27,391 acres owned outright by the Silvio O. Conte National Fish and Wildlife Refuge is the result of one Special Focus Area identified for protection near the Canadian border in northern Vermont. On July 21, 1999, the U.S. Fish and Wildlife Service purchased from Champion International Corporation 26,000 acres to establish the Nulhegan Basin Division of the Conte Refuge.[10] The Vermont Agency of Natural Resources acquired about 22,000 acres adjacent to the basin. Easements were placed on an adjacent and surrounding 84,000 acres, to protect them from subdivision and development. The easements allow continued timber management and production. In all, long-term conservation is provided for 132,000 acres, through a combination of federal/state ownerships and easements.

In 2002, the Conte Refuge acquired 140 acres of the former Mount Tom Ski Area in Holyoke. The refuge coordinated with the Commonwealth of Massachusetts, the Trustees of Reservations, and the Holyoke Boys and Girls Club to purchase almost 400 acres adjacent to the Mount Tom State Reservations. In the summer of 2003, the Conte

Refuge hosted clean-up days, with volunteers scouring the mountainside along abandoned ski trails for snow-making hoses, metal scraps, ski poles, and other discarded objects.

Thoughts on the Conte Refuge and Massachusetts Forest Lands

Primary interest by the Conte Refuge in Massachusetts's forested lands is in stands of trees in the identified Special Focus Areas on Mount Tom, the Holyoke Range, presumably pitch pine forests on the Montague Plains, and riparian forests along identified rivers such as the Mill River. Secondarily, the Conte Refuge is interested in other forested areas within the Connecticut River watershed as corridors for preservation of wildlife, for example, to enable fisher cats or moose to wander from the Quabbin Reservoir north to the New Hampshire border.

It is unlikely the Conte Refuge would lend significant support for Massachusetts forests beyond the Connecticut River watershed. However, the Refuge is mandated to protect wildlife, and wildlife generally does not recognize watershed boundaries. A case could be made for assisting forested lands outside the watershed. This is not likely to succeed, given that the Conte Refuge already has responsibility for managing an enormous area in four states, 7.2 million acres, with very few employees. The staff was further challenged this spring when Congress delayed passing the Interior Appropriations Bill, forcing the Conte Refuge to suspend the Challenge Cost Share Program for the year.[11]

The Conte Refuge has no interest in acquiring more lands for itself. With grasslands and cleared lands, such as farmlands, being developed often before forest lands, preservation of forests might not be a high priority. The Conte Refuge has, nonetheless, worked very well in collaboration with other federal, state, and local agencies to preserve forests. This was apparent in the Nuhlegan Basin of northern Vermont, where much of the land preserved is forested. Forestry, controlled burns, and timber harvests are not areas of expertise for Refuge staff. Instead, National Fish and Wildlife Refuges are apt to hire a forester to consult on any silvicultural practices.

The Silvio O. Conte National Fish and Wildlife Refuge is the only federal agency to have conserved, protected, and enhanced Massachusetts forests in the Connecticut River watershed. When local, state, and private nonprofit groups asked for help in preserving forests and preventing development on Mount Tom, the Conte Refuge was there to meet the challenge in collaboration with the Commonwealth, the Trustees of Reservations, and the Holyoke Boys and Girls Club. Should an opportunity for a coalition of forest preservationists arise in Massachusetts, it would be prudent to consult with the Conte Refuge staff.

QUINEBAUG AND SHETUCKET RIVERS VALLEY NATIONAL HERITAGE CORRIDOR

The Quinebaug and Shetucket Rivers Valley National Heritage Corridor began as a small grassroots organization in northeastern Connecticut called the "Quinebaug Rivers Association" (QRA).[12] The organization came together in the realization that the traditional rural region was facing development pressures, and the unique character of the region was threatened. In 1988, the same year that QRA began meeting, Congress also found that Connecticut ranked last among all fifty states in its amount of federally protected open space, and a distant last among northeastern states in public land available for recreation (QSHC Advisory Council 1997).

The Quinebaug River Association formed a subcommittee called the "Quinebaug-Shetucket Corridor Committee" in 1988, to work with state and local agencies on ways to simultaneously promote and protect the character of the region. They launched events, most notably the "Walking Weekend," three days with dozens of guided walks and hikes, to showcase the area's history, environment, agriculture, and other unique features. The thirteenth annual Walking Weekend, now called "Walking WeekendS," occurred on Friday, October 10 through Sunday, October 19, 2003. The additional days permitted greater participation, relaxed the scheduling logjam, and extended activities to include school groups.[13]

Also in 1988, the National Park Service conducted a study of the twenty-five-town region in northeastern Connecticut, to assess the national significance of the region's historic, natural, and cultural resources and their potential for interpretation. In 1994, Congress passed legislation and the president signed into law the Quinebaug and Shetucket Rivers Valley National Heritage Corridor, the fourth heritage corridor in the country (P.L. 103-449 105). The next year, the Quinebaug-Shetucket Corridor Committee was incorporated into a nonprofit organization, the Quinebaug-Shetucket Heritage Corridor, Inc. (QSHC). Connecticut Governor Rowland designated QSHC the official body to manage projects and federal funds. The National Park Service recognizes QSHC as the "management entity" that coordinates the partners' actions.[14] In 1999, additional legislation expanded the heritage corridor to include thirty-five towns, nine of which are in Massachusetts.

National heritage areas, as defined by the National Park Service, are regions in which entire communities live and work, and in which residents, businesses, and local governments have come together to conserve settled landscapes and their own heritage.[15] The National Park Service (NPS) does not acquire new land in these areas, and the

federal agency has no regulatory authority. The National Park Service's role is as a catalyst, providing technical assistance and financial assistance for a limited period.

National Heritage Areas have a mandate that may conflict with itself unless clear traditions of land use have already been well established and identified as worth preserving through time. Their mandate is to protect and enhance a region's unique natural resources and, simultaneously, to promote appropriate economic development and redevelopment. For example, in 1986 the Blackstone River Valley National Heritage Corridor was established to recognize how the American Industrial Revolution began along forty-six miles of river and canals from Worcester, Massachusetts, to Providence, Rhode Island. The Essex National Heritage Area was established in 1996 and includes Essex County, Massachusetts, from coastal Cape Ann to the inland city of Lawrence. This heritage area illuminates colonial settlement, the development of the shoe and textile industries, and the growth and decline of the maritime industries. Of the three national heritage areas in Massachusetts, only the Quinebaug-Shetucket was establish to recognize natural, rural, and non-industrial historical qualities: to preserve and promote "one of the last unspoiled and undeveloped areas in the northeastern United States."[16]

When Congress designated the Quinebaug and Shetucket River Valley as a national heritage area it strongly encouraged the state to prepare a nonbinding management plan and authorized matching funds to help implement it. To comply with federal law, the Connecticut legislature created the Quinebaug-Shetucket Rivers National Heritage Advisory Council. The Advisory Council consisted of representatives from seven state agencies and twelve appointed members. The Council developed a management plan to synthesize the goals of the original Heritage Corridor Committee and the federal enabling legislation. They prepared the plan with public input. Once the long-range management plan was developed to serve as a guiding document, the Council disbanded.

The management plan survives as an advisory document that lays out desirable land uses. It is used by QSHC, Inc. to help citizens, nonprofit organizations, businesses, and local and state agencies retain, enhance, and interpret the corridor's significant natural features and structures. QSHC works in a cooperative venture and formal partnership with the University of Connecticut Extension System to develop and implement education curriculum and program offerings. QSHC continues to determine the existence of programs that will fulfill the visions and goals of the management plan, and identify potential new programs that will fill gaps.

QSHC refers to their region in all publications as "The Last Green Valley." Charlene Perkins Cutler, QSHC Executive Director, noted how difficult and immediate lessons must be learned in attempts to balance growth with preservation: "When we call this region 'The Last Green Valley,' we surely do not want to be referring to it in the past tense. But unless we take steps now to conserve and celebrate its unique resources, we will someday be obligated to see it not merely as endangered, but extinct."[17]

There is much public pride in the forests of the Quinebaug and Shetucket River Valleys, according to a recent issue of The Quinebaug-Shetucket:[18]

> The Last Green Valley provides specific positive benefits for the people of America, particularly those living in southern New England. Our forests play a great role in generating and preserving that quality of life:
> - Seventy percent of the land in The Last Green Valley is composed of forest and farms.
> - The forests of The Last Green Valley provide oxygen for 8.3 million people, exceeding the needs of the population of the National Heritage Corridor more than twenty-seven times.
> - Our forests filter and store 1.2 million tons of carbon that would otherwise remain airborne.
> - Our forests produce 1.4 million tons of new topsoil every year, compensating for erosion in stressed parts of the ecosystem.
> - There are seven state forests (including the largest in Connecticut) in The Last Green Valley, providing abundant recreational benefits.
> - Our forests remain a renewable resource, providing firewood, building lumber, railroad ties, wooden pallets, and a host of other wood products from mulch to animal bedding.
> - The forests of The Last Green Valley provide valuable habitat for a multitude of wild creatures, from birds and bats to foxes and fishers and, occasionally bears — all important players in a balanced ecosystem.

The Quinebaug River Association, a local organization, brought national attention and greatly increased local pride in the area's natural resources when it persuaded Congress to recognize the region as a national heritage corridor. The National Park Service brings many small matching grants and a great deal of knowledge/experience in interpretation, low-impact recreation, and promoting tourism. The Quinebaug-Shetucket Heritage Corridor, Inc operates with a general management plan that has much credibility in the community.

Despite all of this public acclaim and national recognition, the QSHC has no regulatory authority, and the NPS

has no authority to implement national standards. Public pressure remains the only means by which the heritage corridor can block inappropriate development and prevent the deterioration of natural areas. However, QSHC is positioned well to bring much public pressure to bear, because it has already established collaborative working relationships with politicians and groups that have compatible missions, for example, the University Cooperative Extension Service, Conservation Commissions, and the Tri-Community Area Chambers of Commerce.

Thoughts on the Quinebaug and Shetucket Rivers Valley National Heritage Corridor and Massachusetts Forests

The Quinebaug-Shetucket Heritage Corridor presents an example of how a region can come together to promote and celebrate one of the last unspoiled and undeveloped areas in the northeastern U.S. The National Park Service acts as catalyst providing technical assistance and limited financial assistance. Could this be done for the forests of Massachusetts?

The National Park Service collaborates in partnership with local agencies and communities on theme-related heritage areas in other parts of the United States.[19] The America's Agricultural Heritage Partnership operates in a thirty-seven-county region of Iowa. In Michigan, six corridors form the Automobile National Heritage Area. In Pennsylvania, the Steel Industry American Heritage Area links the mills and workers' communities with hiking trails and riverboat tours. In West Virginia, there is the National Coal Heritage Area. Could there be a Forest Industry Heritage Area celebrating timber management, maple sugar production, biomass fuel generation, and other forest industries of Western Massachusetts and adjacent regions? Such a heritage area would work to preserve a way of life and promote responsible stewardship of public and private forests.

THE BOSTON HARBOR ISLANDS NATIONAL PARK AREA

In 1996, Congress established the Boston Harbor Islands as a unit of the national park system. The legislation (P. L. 104–333) mandated an unusual management structure that brought together three key groups: The Boston Harbor Islands Partnership was created to coordinate the activities of the thirteen island owners and managers, public and private, in developing and implementing a general management plan. A twenty-eight-member Advisory Council represents various interest groups and holds two of the seats on the Partnership. The Island Alliance, a private nonprofit organization, holds one seat and is charged with raising private funds to support the park.[20]

The national park area was founded on the principle that successful preservation, restoration, and management of the thirty-four islands could best be achieved through a mix of strategic public and private collaborative efforts. In addition to agencies that owned island property, Congress configured the B.H.I. Partnership to include organizations that have a role in managing some aspect of the national park. For example, MassPort and the Boston Redevelopment Authority have seats on the Partnership, while businesses and municipalities are part of the Advisory Council. The Partnership's charge is to better coordinate the federal, state, and local authorities and private-sector interests in the Harbor Islands. Over the course of three years of meetings, a general management plan for the park was unanimously developed that will protect park resources, and at the same time guide future development and improve visitor programs and access.[21]

Before there was a national park area, sixteen of the thirty-four islands comprised the Boston Harbor Islands State Park. The city of Boston operated facilities on Long Island. The Trustees of Reservations maintained a natural area, including a historic landscape designed by Olmsted (for a development that was never built), at World's End in Hingham. A private, independent, Outward Bound program operated on Thompson Island. This is an urban park adjacent to Logan Airport that serves densely settled communities in many ways, including showcasing the largest and most modern sewage treatment facilities in the country. The park also provides refuge from the urban hustle and, as Olmsted said of Yosemite: "contemplation of natural scenes of an impressive character . . . in connection with relief from ordinary cares, change of air and change of habits."

The National Park Service did not come to Boston Harbor to acquire property. Indeed, 1996 was also the year Congress formed a committee to look into dismantling and reducing national parks. Instead, NPS came to Boston Harbor to facilitate discussions among island owners and to promote collaborations among organizations. The politics of working with nonprofit and government institutions in Boston has been referred to as "elephants and butterflies," because the participants range from large agencies to very small nonprofits. Small organizations can accomplish much when they collaborate with large organizations. Large organizations gain public recognition and often increased legitimacy when they collaborate with smaller, more localized organizations. Unfortunately, such alliances usually do not last for very long.

The National Park Service brought sufficient political clout and national stature to Harbor Island politics to keep local elephants and butterflies alike engaged in resource management and preservation issues. What had previously been just one of many environmental issues in the

Commonwealth suddenly became a priority, with national implications and opportunities. Much of the success of reaching consensus on the general management plan is due to the Park Service's professionalism and preparedness at meetings. Success was due in no small part to how the leadership of all partnering organizations stayed involved in the decision making process over the entire three years. No one delegated responsibility, skipped meetings, or marginalized the efforts of others.

For the Boston Harbor Islands, the NPS appointed eight representatives of federally recognized Native American tribes to the Advisory Council as members and as first alternative members. The NPS and Partnership also welcomed to all meetings representatives of tribal groups not recognized by the federal government. One Advisory Council tribal group came to meetings from distant Oklahoma, where they had been moved from Boston in the nineteenth century by the federal government. Developing a management approach for the forestlands of Massachusetts should not involve such multinational and multicultural complexities, or traveling such great distances.

Participatory Ecological Governance

The creation and early years of the new park and governing partnership represented the next step in a series of advances in environmental management. During the last four decades, the command-and-control orientation in environmental affairs has been changing to a more participatory, inform-and-consent orientation where private concerns, regional stakeholders, and the body politic have a voice in decision making. This more democratic and partnership-based practice in a context of ecological management is called "participatory ecological governance." Participatory ecological governance is the human endeavor to achieve sustainable living in the global environment by acting responsibly in the local environment. What can the principal participants of the Boston Harbor Islands Partnership tell us about building consensus, environmental leadership, and participatory ecological governance, in both theory and practice?

Some Observations of Concepts and Processes

With the advent of the Boston Harbor Islands, the NPS held less sovereignty and authoritarian control of a national park area than ever before. This was appropriate for the NPS because it did not own any property in the park. In contrast with other national parks, the Park Service never usurped or bought authority away from local, state, municipal, or private institutions, or from homesteaders in the Harbor Islands. This condition was made explicit by NPS staff to local institutions in order to garner their support for a national park that would cost the federal government very little to create. Thus, this park represents a next step in the NPS's evolution to becoming an information-managing agency, in addition to being a property-managing agency.

The law that created this park (Public Law 104-333, the Omnibus Parks and Public Lands Management Act of 1996), makes many references to an area managed and administered in partnership (see Sections 1029 (a)(2) and 1029 (d)(1)). The only ambiguity to partnership government is in Section 1029 (d)(7): "The Secretary shall preserve, interpret, manage, and provide educational and recreational uses . . . in consultation with the owners and managers of lands . . . in accordance with the integrated management plan." This language was added late in the legislative process in an attempt to hold the NPS ultimately responsible for the implementation and maintenance of the general management plan. It has yet to be determined whether this makes the NPS more accountable for governance than any other member of the Partnership. Section 1029 (f), requiring the development of the integrated resource management plan, places the burden squarely on the entire Partnership: "The Partnership shall submit to the Secretary a management plan for the recreation area to be developed and implemented by the Partnership." Wherever ultimate authority rests, this language increases the importance of the management plan. The plan needs to be inclusive of everyone's interests, so that there might never be an issue of one entity exerting authority over another during implementation, or one partnering institution pulling property out of the national park.

The Boston Harbor Islands Partnership was able to practice participatory ecological governance across thirty-four islands and peninsulas in the Boston Harbor during the time period from the park's enabling legislation in 1996 until I completed my observations in 2001, when the *General Management Plan (GMP)* was unanimously approved by the Partnership. The thirteen partners, representatives of institutions, and the Advisory Council made governing decisions for the park that recognized the ecological and social complexities of natural resource management in an urban metropolitan area. Partnership meetings were open to the public, and detailed minutes were made available. Interest groups were encouraged to speak and were listened to. In addition to invited presentations, all meetings had a public comment period. Much of the work of governance was carried out in open committee meetings that made recommendations to the Partnership for approval. During the years of meetings, the Partnership successfully built a unanimous consensus for a general management plan.

Agreeing on that long-range plan took nearly two years

longer than predicted in the enabling legislation. Fortunately, the framers of this park's legislation made it possible for the park to begin work before the *GMP* was approved. Improvements such as building docks, stabilizing erosion, and removing hazardous materials have proceeded in part with funds and administrative support from the NPS and from the Island Alliance, demonstrating the value of turning the Harbor Island resources into a national park unit and creating an independent nonprofit institution that could act as fiscal agent for private contributors. Extensive biological and historical inventories and assessments are now underway, with federal funds going to locally recognized scientists and researchers. Steps and small successes like these have motivated participants to stay committed to the long process of agreeing on the *General Management Plan*.

My research on the process of generating the plan did not measure the effectiveness of the Partnership's implementation of plans. The "rubber" of implementation has yet "to hit the road" in this case. Further research is needed to see if participatory ecological governance continues to be effective throughout a period of implementation.

However, some implementation steps were completed during the years of planning and my years of research. These were not the specific responsibility of the Partnership or the NPS, although successes were shared by everyone. Responsibility lay in the individual property-owning entities. For example, half of Spectacle Island is owned by the Massachusetts Department of Environmental Management (DEM), and half is owned by the City of Boston. When the island was raised 350 feet with fill from the Big Dig, and plans for a visitor center completed, only the DEM and City of Boston were responsible. Other members of the Partnership, including the NPS, were only advisory and held no authority over the decisions or the actions taken. Within national park areas, this arrangement of responsibility and authority is unprecedented, yet it is in the nature of partnership governance.

A criticism expressed by three of the fourteen research participants was that the NPS did not do enough during my research period. I thought the NPS was doing quite a bit, but to observers less familiar with the inner workings and bureaucratic steps of the NPS, implementations are the most obvious accomplishments, in particular those brought about by the NPS that individual island owners would not have done without the NPS. This was a tall expectation, considering that all of the island owners, given prevailing economic and political conditions, were behind on delivering their own improvements and on meeting ongoing maintenance requirements. Funds were needed just to maintain and prevent further degradation of the Boston Harbor Islands.

For example, I was impressed that the NPS was able to secure from the federal government $300,000 to repair a seawall. However, the state agency that owned the island with the seawall was required to contribute some matching funds in order to receive the federal funds. The island seawall was not at the top of the state agency's list for expenditures, and the commissioner did not have the authority to rearrange, opportunistically, the agency's expenditure priorities. Consequently, the federal funds were never used, no repairs were done to the seawall, and the NPS appeared, at least to its critics, not to be doing enough for the park. The NPS did not have the authority to bring about an adjustment to the spending priorities of an island owner, even when both the owner and the NPS wished to see the repairs done, and when the bulk of expense would have been borne by the federal government.

Two challenges identified in my research were to bridge a cultural difference between administrators and participants, and to address the length of time the process required to work. When, and if, the seawall repair expenditure reaches the top of the state agency's list of priorities, I expect the park director will again seek federal support in concert with the owner's timetable for implementation. With sufficient time, differences and difficulties can be worked out. Patience with diligence is a virtue in participatory ecological governance.

Findings

In addition to finding that the individual partners were competent, I found the autonomy given them by their institutions important and significant. I first noted the autonomy given to NPS Director for Regional Planning, Sarah Peskin. She believed she had unprecedented freedom to innovate and craft participatory legislation for this park, and her perceptions were confirmed by more senior NPS administrators and most publicly by Congressional Representative Gerry Studds. This a tribute to both the NPS, which in this case was not the classic bureaucratic command-and-control institution that I expected, and a tribute to the individuals higher in the agency. For an example, Terry Savage, Peskin's immediate supervisor and former holder of her position, delegated much to the regional planning director.

At the first meeting of the Partnership, Savage was the NPS partner presiding over the meeting, and park director George Price was the alternate partner. With a visible presence and superior position, I expected Savage to lead more and to take more responsibility for the new park's administration. Instead, and consistent with his delegation of authority to Peskin, Savage gave Price the freedom to take actions unilaterally, work his own way out of potential con-

flicts, and in general take both the heat and the credit for anything related to the new park's operations. Consensus might have taken much longer if Peskin, Price, and other partners had been given less autonomy by their institutions. Nonetheless, they always seemed to report back and check consensus within their institutions before making any Partnership decisions final.

I found that consensus building begins with representativeness, i.e., including representatives from all relevant and significantly different interests. For the Boston Harbor Islands, testimony for or against the formation of a national park was solicited early on from representatives of many different interest groups. Federal legislation insisted on wide and fair representation on the Advisory Council, as well as complete ownership representation on the Partnership. Thus, participatory ecological governance was driven by a purpose that was both practical and shared by the group. This process benefitted from a wealth of personal experiences, expertise, and institutional knowledge. It was self-organizing within the broad legislative and NPS frameworks. Participants were adept at and incorporated high-quality information into their decision making, which kept participants at the table, interested and learning. Those who stayed involved in building consensus communicated with competence and practiced forms of leadership appropriate for participatory ecological governance.

Most of the partners who gathered to govern the Boston Harbor Islands brought to the process extensive experience and knowledge of the Boston Harbor Islands. Edith Andrews, the partner representing the Advisory Council and native American interests, traveled the greatest distance to Partnership meetings. She brought with her a deep understanding of native American history and social ties to the new park area. She also brought knowledge and experience of how consensus is built.

I was surprised and pleased to discover in the course of my research that a great number of senior NPS administrators and directors working in the NPS's Northeast Region were experienced with the Lowell National Historical Park. In its time, Lowell was a cutting-edge participatory experience for the NPS. Unlike the Boston Harbor Islands, in Lowell the NPS owned property. But in Lowell, as well as Boston Harbor, the agency was required to work collaboratively with local and state agencies to manage a park that extended well beyond the land in federal ownership. Lessons of NPS-private collaborations learned in Lowell benefited George Price, Sarah Peskin, Terry Savage, and others in the NPS to the Boston Harbor Islands Partnership. By not regularly moving administrators about the nation, the NPS was able to appoint to the Boston Harbor Islands managers who were already acquainted with local social and natural resources, and savvy about local politics. Many participants in my research commented that a visible strength of the park, and perhaps a precondition for successful consensus building and partnership governance, was the extent to which all thirteen of the partners were very knowledgeable and able to direct resources in support of the Harbor Islands.

From this experience, future consensus-building endeavors should learn first, to pay close attention to the process of deliberation that will lead to consensus, including representation and civic behaviors. Second, but probably of equal importance to the process, are the skills, experiences, knowledge, and talents of the participants. Third, individuals will be more effective when their institutions give them autonomy and permission to innovate. This case appears to have benefitted greatly by going both with experienced and talented participants, and with wise and trusting administrators, who delegated authority to others.

Self Interests and Civic Behavior

When the Partnership first met, the individual partners already understood their own interests. Moreover, many had interacted with each other and were already aware of each other's interests. They understood participatory decision making processes through similar experiences, either within individual agencies or across diverse groups of interests. Significant time was then spent learning together the best approaches within the framework of knowledge and resources brought to the Partnership. A great willingness to learn and understand technical and scientific information was evident when the partners questioned presenters and reports, and whenever individuals referred to reports by others when making their own presentations. Strong interests in understanding social, political, economic, and historical contexts were also evident. Both individually and collectively as the Partnership, members possessed authority, resources, and information to decide, reward, sanction, and manage. Remarkably, government agencies at the municipal, state, and national levels were all open to trying novel and entrepreneurial uses of their resources.

The civic behavior of partners was valued even more than their knowledge or resources. Partners expected and received respect for the knowledge and the experiences they each brought to the governing institution. Many believed that the Harbor Islands had been well-managed before the NPS arrived, and would have been managed even better if only there had been sufficient resources to do so. The partners appreciated the range of ethnic and cultural perspectives as a means to increase their collective understanding and knowledge of the resource and its use by people with diverse interests. Many partners went beyond accepting different values and interests to actively

seek out broader perspectives for the general management plan. The partners showed great respect for the public, consistent with the park's mission to serve the public. They developed confidence in their problem-solving skills. They were able to handle the passion of people who cared deeply about aspects of the park and the management practice, and they tended not to take things too personally. In addition to bringing patience and an interest in planning to the discussions, the partners were committed to program implementation, beginning well before the plan was completed. This commitment and their motivations sustained dialogues that went on for months. Out of this mutual experience developed a communal spirit with both common and self-interested goals. They retained independent-minded, individual manners while becoming increasingly trustful of each other and of the consensus-building process.

The partners became more competent in the practice of civil discourse over time. Competence characteristics include fairness, openness, trust, sincerity, and empathy. They practiced listening and communication skills, using more inclusive, less adversarial speech and speaking in the process of being heard. They practiced self-reflection. This was abundantly evident in the individuals I interviewed, in their willingness to openly reflect with me for great lengths of time on the process of partnership-based governance. For consensus building to succeed over time, I observed that deliberative democracy is an excellent ideal, goal, and motivator. Deliberations often included value discussions. The setting of agendas were open and, I believe, fair processes. Learning was an iterative process throughout.

Leadership

A clear example of leadership, but by no means the only example, was the collaborative leadership practiced by Sarah Peskin of the NPS in creating a strategic "bridge" linking together disparate organizations and individuals into the Boston Harbor Islands Partnership, initially through a process of bilateral negotiations.

The leadership characteristics of all the participants in Boston Harbor Islands governance included honesty, integrity, and the ability to delegate well. Many furthered these leadership traits with an ability to trust those to whom they delegated responsibility. Partners succeeded in finding a vision, embracing it, and drawing others to the vision, which in turn inspired commitment and action. Park leaders succeeded in diminishing the gap between the values people stand for and the reality they face. They built broad-based involvement respecting a diversity of perspectives and opinions. They built the Partnership into a learning organization that was adaptive and responsive. They highly valued coping skills, such as versatility and patience. They led by example, challenging assumptions while showing respect for other individuals and institutions. They came to expect nothing less than high civility, a decorum in keeping with the magnitude of their responsibility for a magnificent natural and cultural resource.

Beyond civic discourse and collaborative leadership, specific individual skills contributed to the workings of the Partnership. While creating and reaching agreement on the *General Management Plan,* the individual Boston Harbor Islands partners practiced and developed analytical skills for critical thinking, dialogue, problem solving, and judging the opinions of others, in particular those claiming to be experts. They built committees and managed to work out difficulties in relationships. Through practice, they evolved the ability to work well with public agencies, private organizations, interest groups, and citizens with wide-ranging interests. The partners learned to distinguish unifying from adversarial majority-rule decision making procedures. They rarely voted, and when they did vote it was often to demonstrate their unanimity. While there were the inevitable social pressures to conform within the group, especially as the group became more familiar and congenial through working together, there was never overt pressure for an individual partner to depart from his or her organizational interest to join the majority. Instead of forcing decisions, the group took more time. They brainstormed, creating shared visions and goals. Opinions were expressed and questioned. Negotiating and listening skills were practiced. New ideas were generated and creativity was fostered. The partners succeeded in staying engaged in resource governance. These practices of environmental leadership through individual investment succeeded in inspiring commitment and hope for a better Boston Harbor Islands and park experience.

Although the leadership practiced in this case was nearly always collaborative, it had many variations. Both "servant leadership" and "adaptive leadership" were practiced by different participants at different times. The Boston Harbor Islands thus yielded a number of insights about leadership. First, individuals did not always use the same form of leadership at all times. Leaders would sometimes become followers within the Partnership. Second, there seemed to be as many variations of collaborative leadership as there were partners. This is not surprising considering there were fourteen participants in my research and each had been chosen to represent specific interests or groups on the Partnership. Third, a group of leaders, practicing many variations of collaborative leadership, worked together within a single decisionmaking group and enabled the group to reach consensus. Fourth, leadership was not expressed in the corporate hierarchical tradition, with one

leader at the top of an organizational pyramid. Instead, and fifth, a more egalitarian leadership was observed, in which individuals led as one among equals. Different individuals would take the lead for different challenges. When not in the lead, they continued working as members of the group. In this way, peers were encouraged to lead in those situations for which they were best suited, without tarnishing the leadership image of another.

The egalitarian form of leadership within the Boston Harbor Islands Partnership appeared more dynamic and adaptive to the changing conditions of participatory ecological governance than more traditional forms. Leadership talent may be latent in all members of a group, but may not be recognized until a situation for which a given leadership talent is well-suited arises; when there is opportunity, the individual leads as a first among equals, through the situation.

The leadership manifested by the BHI Partnership began with individuals serving as partners who were themselves leaders in their own organizations. In order to become an efficient group as the Partnership, those who led in their own institutions had to defer to the chair's leadership on the Partnership. Each of the five committees was chaired by a different partner, and often another partner stood by as vice chair to serve in the chair's absence. In my experience, and judging by the results produced, all committees were led well. The Partnership chairperson did not chair any committees. Yet committees were often more difficult to manage than the Partnership as a whole, because there were more active discussions and because the committees lacked the formality that undergirded and supported the chair's leadership in full Partnership meetings.

Rules, regulations, and enforcement provide both a protective structure and an enabling framework for the Boston Harbor Islands Partnership. This particular case of governance is significant because it marks a deliberate lessening of hierarchical decision making within a government institution, while increasing a pluralist political legitimacy for non-NPS local agents. The Boston Harbor Islands Partnership must operate within a new NPS regulatory structure and framework whereby a broad and open partnership of local, regional, and national participants governs. Without this regulatory structure, which still includes the hierarchical National Park Service (fondly referred to as "the 800-pound gorilla in Washington"), it would have been much more difficult for the Partnership to govern and reach unanimous agreement on a general management plan. But with the right structure, backed up by rules, regulations, and enforcement, participatory ecological governance for the Boston Harbor Islands National Park Area is succeeding.

Indicators

Channel markers tell boat operators navigating the Boston Harbor whether or not they are on course. Practitioners of participatory ecological governance also need indicators, to help them tell when they are on course toward the resolution of a decision and completion of an action, and when they are off course or no longer making headway. Because deliberative participatory governance often takes longer than one expects, markers of progress become vital for keeping people engaged in the governance. It is much easier to stay the course when you know you are on the right track, even if the pace of progress is very slow.

There were a series of channel markers along the course of the Boston Harbor Islands' participatory ecological governance. First, the partners developed a common language that was more inclusive and civil, and less adversarial and contentious. Second, creative ideas for action were produced. Third, stalemates were overcome and a sense of progress developed toward high-quality agreements. Fourth, information and analyses emerged that not only the partners but also stakeholders at large understood and accepted as accurate. Fifth, new personal and working relationships developed not only between partners but most especially among the many participants in committees and meetings. Improved or new relationships are valuable forms of social and political capital for participants. Sixth, participants gained knowledge and understanding. Seventh, and finally, proposals and plans were produced that appear feasible from political, economic, and social perspectives, and were widely accepted.

Navigators may challenge the order of these channel markers. The order is not significant, nor is it necessary to recognize all the markers. I may have missed some that are important to others, but I do not think so, having drawn these from the participatory practice of the Partnership. What is important is that signs of progress be evident from the first meeting to the agreement. In this case, the voyage from the first Partnership meeting to its approval of the General Management Plan took a long time, nearly five years from the passage of the enabling legislation. There were times when a number of participants thought the governing or planning process had becalmed. During these moments, individual commitments to stay engaged in the process may have started to ebb. Nonetheless, all fourteen of the interviewed participants stayed active for the duration. Recognition of one or more of the channel markers described above kept participants on course and working toward their common destination.

There are additional positive indicators for the Boston Harbor Islands Partnership. During the public workshop period that followed agreement on the preferred plan, it

became apparent that the learning and knowledge produced within the consensus-building process was shared by others outside of the Partnership. There were also second-order effects beyond the governance and agreements reached, such as changes in behaviors and actions, spin-off partnerships and working groups, other collaborative activities, new practices, and even new Harbor-oriented institutions. Participants found personal satisfaction in working for such institutions and with each other. Finally, partners found that they had created a participatory institution that is flexible, inclusive, and networked. This Partnership was able to respond to change and conflict in ways that were more creative than those most organization partners had experienced before.

Beyond being indicators for the process of planning and implementing participatory ecological governance, these characteristics are beacons that indicate directions for successful outcomes. They are respectful of the evolving, dynamic, and complex system being governed, and do not offer definitive answers. Three broad outcomes can be recognized that, if not proof-positive, can at least indicate positive direction today and for future decisions. First, are the outcomes regarded as fair and just? Second, do the outcomes seem to serve a common good or public interest beyond the participating stakeholders? Third, do the outcomes contribute to the sustainability and preservation of natural and social systems? If the Boston Harbor Islands' participatory ecological governance were a ship, I would say the ship is steering true to course — perhaps not moving as fast as many would like, but nonetheless making significant headway.

Ten Decision Making Factors Observed in the Boston Harbor Islands Partnership

As illustrated by the Boston Harbor Islands, these factors are likely to be important in all successful participatory ecological governance endeavors.

1. Principal participants were knowledgeable and competent.
2. Inclusivity and diversity of participants was strongly emphasized.
3. Civic behavior in meetings was respected and encouraged, and smaller accomplishments reached during the process were celebrated.
4. Participants had sufficient autonomy to innovate, and were not too constrained by their institution or the group they represented.
5. Positive language was used with compelling examples given to foster understandings, values, and to serve as indicators of progress.
6. Participants remained curious and open to learning how to find areas of common and corresponding interests that satisfied their own and everyone else's needs.
7. Time was spent together learning each others' interests, concerns, and values, and developing trust.
8. The unexpected was expected; adaptive actions were taken in changing and unexpected circumstances; decisions were often dynamic and responsive.
9. The Partnership became a bridging organization that brought together public and private organizations into a closer working relationship, probably closer than ever before.
10. Federal, state, and municipal government agencies, private interests, and citizen groups were governed in concert, so that no institution or group ceded sovereignty or authority to another.

The first observation is the importance of knowledgeable and competent participants. In this case many of the partners and most of the participants in my research brought years of experience gained in the institutions they represented, as well as a familiarity with the Boston Harbor Islands. Especially impressive for me was the use of positive language and the professional excellence of the National Park Service personnel, who said with confidence that partnership ecological governance could be done, and then succeeded in doing it. While I expressed my occasional doubts and reservations, I never heard a word of doubt from any of the NPS personnel who I encountered over a five-year period. They were not naive — they knew many of the challenges that lay ahead, they knew it was often a long-term process, and they were very competent. One is tempted to conclude that participatory ecological governance will work for a national park only if one employs individuals such as these, but the BHI staff would be quick to disagree. Recognizing the values of knowledge and competence, they would also advocate for the practice on its theoretical, and now practical and proven, merits. We have seen it work with the right leadership and environment — a community of people who became committed to an ideal and able to see magnificence and wonder in their ecosystem.

Partners were brought into the process as a result of the second observation: inclusivity and an effort to build diversity of participants. For example, Edith Andrews joined the Partnership to represent the Wampanoag Aquinna Tribe and the Advisory Council. She brought experiences with parks and environments in New Bedford and on Martha's Vineyard, and she brought a cultural perspective on the

environment that differed from the perspectives of other partners. The partners always worked to involve people attending the monthly Partnership meetings by introducing newcomers, by urging them to attend committee meetings, and by actively soliciting views and comments, if not during the meeting, then immediately following the formal proceedings on a more person-to-person basis.

The third observation, the importance of civic behaviors of courtesy and respectful interaction, was vital to both the consensus building and environmental leadership I found in the practice of the Boston Harbor Islands Partnership. Examples of civic behaviors include how visitors were made to feel part of the governing process by the active solicitation of comments as described in the second observation above, and most particularly the respectful, knowledgeable, and mutually beneficial ways that the partners worked with each other.

Autonomy to innovate, the fourth observation, was an ability I first found in Sarah Peskin's collaborative work with Congressional Representative Gerry Studds and Eileen O'Brien, when drafting legislation for the new park. The NPS is to be commended for having the courage to give such autonomy to their senior planner. Each member of the Partnership needed some authority and autonomy from the institutions or groups they represented in order to contribute to the decision making process. Participants had to be more than a conduit for information from one institution to another. Partners often earned respect from people outside of the governance group, to the extent that they both represented institutions and maintained the autonomy to respond directly to issues, especially to issues raised by individuals and citizen groups. For example, I was surprised by the extent of apparently autonomous action the local Coast Guard Commander was able to take within his hierarchical institution on behalf of increasing public access to Little Brewster Island.

The fifth observation from the Boston Harbor Island practice is that positive language and compelling examples contribute to the success of endeavors in ways that are impossible to measure. When building consensus, the Partnership took as its metaphor and inspiration the "puddingstone." This is a local ancient rock, half a billion years old, and part of the bedrock that lies beneath the southern half of the Boston Harbor from Hull to Dorchester. It became symbolically important to the Partnership because of the way it is formed and for the way it looks. Puddingstone, a conglomerate, was formed by pebbles and cobbles of gray granodiorite from Dedham, white quartzite from the Westboro Formation, and dark felsite from Mattapan volcanics, all fused together in a grayish-pink, fine-grained, granitic sandstone — like a bread pudding complete with rounded chunks of apple, bread, and raisins. The wonder of puddingstone is that the different pebbles have maintained their individual identities, while fusing together into a a rock that has remained solid for hundreds of millions of years. Looking at the puddingstone gave the partners hope that they could come together in partnership without having to give up their individual identities. The puddingstone metaphor enabled participants in the governance of the Boston Harbor Islands to cast off the "melting pot" analogy and validated instead an indigenous, place-based, mosaic metaphor for the diversity of interests still prominent within one united participatory governance system.

Remaining curious and open to learning how to find areas of common and corresponding interests, so that participants can find ways to meet their own needs and satisfy everyone else, is observation six. Consensus for the *General Management Plan* would never have been reached if partners only attended the portions of meetings where items of interest to them were on the agenda. Instead, partners actively listened to items concerning other partners, and often offered insights from their perspectives. Many indicated either publicly in the meeting, or to me in less formal settings, that the way another partner dealt with a challenge was valuable knowledge. This not only led to a fuller understanding of the individual's institution, but it was also useful knowledge for the listener should a similar challenge ever arise in her or his institution. Two research participants expressed astonishment in our interviews at the extent of knowledge and experiences assembled in one meeting of the Partnership. Imagine how expensive it would be to hire a team of consultants with that much experience and knowledge to advise your institution!

The seventh observation was the time spent together learning each other's interests, concerns, and values. With time, trust between participants can develop. Participatory ecological governance can be a valid approach for multiparty problem solving when the problem to be solved is long-range planning. In this particular case, contributing factors to the Partnership's ability to reach consensus were patience and persistence, expanding circles of consultation, and participation. Long-range planning is most appropriate for participatory ecological governance, because participants are expected to take the time to build consensus for plans and approaches for future actions. It is much more difficult to make collaboratively decisions that require quick resolution and lead to irreversible actions. For example, agreeing on the park's name seemed to be a more protracted problem than it would have been in a more autocratic governance system. One goal for a general management plan was to establish the framework, priorities, and procedures that would expedite making decisions in the future. I witnessed an improvement and quickening of the

Partnership's decision making over time, after the partners had spent time together learning each others' interests, concerns and values, and developing trust. However, I have insufficient evidence to be sure this will always work whenever quick decisions are needed. Further research is warranted on the time required to make decisions and, in particular, on addressing unexpected decisions.

Acting adaptively under changing circumstances and in response to unexpected events, observation eight, was found in this case because the BHI Partnership was given the ability to implement some improvements prior to Washington's acceptance of the *General Management Plan,* a condition that was written into the enabling legislation. This capability was a departure from standard NPS practice, and should be kept in mind when considering other applications of participatory ecological governance. While it makes sense to complete all planning before taking any action, due to the significant time needed to reach consensus on the plan it was very meaningful for participants to see improvements being made during the planning process. These steps fostered pride in the park. Without such concrete accomplishments, including surmounting unexpected challenges such those encountered when making Little Brewster Island accessible to the public, it would have been more difficult, and probably would have taken more time, to build the necessary relationships, consensus, ongoing enthusiasm, and results.

The NPS and the Boston Harbor Islands Partnership became a bridging organization bringing together public and private organizations into a closer working relationship than ever before. This observation (nine) is more remarkable than simply preventing conflict between the national government and local authorities. Prior to the NPS's arrival, Massachusetts Governor Bill Weld wanted to dismantle the Metropolitan District Commission (MDC), the oldest bioregional management government agency in the country. When the positive synergies of different federal and state agencies, working together in concert with private groups, became evident in the Boston Harbor Islands Partnership, all talk of dismantling the MDC ceased. Municipal, state, and federal government personnel initially were amazed at the difference in organizational cultures, but quickly overcame that perception to discover that collaborating with peers from other organizations was very rewarding in providing new opportunities and insights into their own work.

The overarching concept of my research and a vital insight, observation number ten, is that the optimal form of participatory ecological governance is governance in concert or partnership with other institutions and citizen groups. For the Boston Harbor Islands National Park Area, the lack of federal land ownership within the park was inextricably tied to the practice of participatory ecological governance. The distinction between ownership and governance is one I think the National Parks and Conservation Association (NPCA) missed when they objected to the formation of the Boston Harbor Islands as a national park area. They objected on the grounds that the government would be giving away too much control, and would therefore be unable to uphold national standards and public responsibilities. They claimed that public agencies and private groups whose interests differed from those of the NPS would make the park into something different from the NPCA's commitment to public access, conservation, interpretation, and recreation. Their fears may have been well-founded based on events in other park areas, but in the Boston Harbor Islands, the NPS could not give away control because they never had any, or any property, to begin with.

More Observations

Based on my observations as the *General Management Plan* was developed through partnership governance, the NPS never gave away any part of its mandate. All members of the BHI Partnership began with values and interests similar to those of the NPS. Over time, as consensus for the *GMP* was built, some values and interests moved into closer alignment, while the rest expanded to include each partner's concerns. What began in some instances as primarily a resistance to unfamiliar language became mutually reinforcing communications. When partners gave more of their time and expertise, they in turn got more. Instead of giving something away, the NPS together with all those represented by the Partnership gained a more significant resource and a magnificent area.

My belief, based on interviews with leaders and those participating in the process, is that participatory ecological governance practiced by the Boston Harbor Islands Partnership created a better, more widely welcomed, and appreciated park than any single federal or private agency could ever create on its own. This conclusion was recently confirmed by a team of consultants who had been hired by the Island Alliance to prepare an economic development plan for the Boston Harbor Islands Partnership. The consultants found "a strong positive attitude toward the establishment of the new National Park Area . . . Those who had hands-on experience with the harbor and islands through roles in their own organizations, personal activities or participation in governance or management of the islands/harbor had well-developed notions of the future potential of the islands. 'Old hands' were generally open to further exploration, either of new ideas or expansion of their own vision." The Sedway Group also reported in 2001 that "interviewees, when asked whom they would like to part-

ner with, had surprising responses that constituted program ideas that could never come about on the basis of the experience and expertise of a single organization. It was an example of how collaborations can create a whole that is greater than the sum of its parts."

For the National Park Service, the process of participatory ecological governance should lead to governance by participants who are increasingly knowledgeable, adaptive, and creative problem-solvers. To become more participatory means to become more inclusive of diverse perspectives, knowledge, and resources. Such gains should lead to better parks. They should also lead to more public investment in and understanding of natural resources and ecosystems, and even to national parks that have greater public access, conservation, interpretation, and recreation.

With further research and practice, the benefits of combining national and local, government and private interests should become more clear and compelling. For example, in the Boston Harbor Islands, local and private interests were both impressed by the professionalism of national experts the NPS was able to bring to the process. Equally impressive was the NPS's funding of local scientists to conduct baseline ecological inventories of the Islands.

To conclude, the three concepts of consensus building, leadership, and participatory governance, and the ten observations from the practice of the Boston Harbor Islands Partnership, lead to seven "best practices" principles for participatory ecological governance.

Seven Principles for Best Participatory Ecological Governance

1. Seek broad representation of diverse interests.
2. Bring knowledge and resources to the governing process.
3. Practice civil behaviors, including respect of others' autonomy.
4. Develop skills in collaborative partnership and strive for bridging.
5. Listen and patiently build consensus.
6. Practice environmental leadership in an egalitarian fashion.
7. Celebrate smaller accomplishments along the way to consensus — go to the Lighthouse.

All seven principles are important for participatory ecological governance, but number seven, celebrating along the way, deserves special recommendation. While working out the details for the *General Management Plan,* various participants in the BHI Partnership collaborated with the U.S. Coast Guard to make the Boston Lighthouse on Little Brewster Island accessible to the public. "Going to the Lighthouse" became a signature metaphor for all who worked on the park, as well as for people wondering what would become of the "new" park.

Ultimately, the success of participatory ecological governance is in the hands of the participants. Nothing brings a group together better, or is more likely to keep participants engaged in the long process, than recognition of steps as noteworthy and, at times, celebratory accomplishments. Along the way, participants should find satisfaction in developing personal and working relationships, satisfaction in gaining new knowledge and understandings, and pride in the creative ideas that emerge from their work. Metaphorically going to the lighthouse on a regular basis produces a growing awareness that when solutions and consensus are reached, they will be high-quality agreements. The outcomes will be regarded as fair and just, and will serve a common good or public interest beyond the immediate interests of the participants. Participants, in turn, take pride in outcomes that contribute to the dynamic preservation and sustainability of both natural and social systems. Fueled by recognition and positive feelings of pride, the ongoing work of participatory ecological governance will continue.

The Boston Harbor Islands National Park Area and Massachusetts Forests

In comparison with the Boston Harbor Islands, the forests of Massachusetts have many more private landowners, and far fewer federal landowners. Unlike the Harbor Islands, the Coast Guard is not involved with forests. Fewer state agencies are involved in forests. Absent is MassPort managing harbor traffic, including the movements of liquid nitrogen gas tankers. The forests of Massachusetts do not have the national attention held by Boston Harbor with its history, unique geological structures, beaches, and recreational opportunities prominently displayed to all who fly into Logan Airport or visit the urban waterfront. Forests of many differing sizes and only local significance may have less need for a national park area, and greater need for something more capable of engaging and rewarding greater numbers of landowners and participants.

FOREST UTILITY

Business entrepreneur Paul Hawkin recommends a "pasture utility" as "a useful model for a mechanism to guard our own commons" that can "maximize the strengths of both the private and public sectors, without succumbing to the failings of either."[22] The pasture utility is a solution to Garrett Hardin's metaphor for "the tragedy of the commons." Tragedy is likely to happen when natural resources

are an "open access" system where anyone is free to take as much as they want. In Hardin's metaphor commoners are very much aware of the welfare of their flocks, but no one is guarding the resource that sheep depend on. A pasture utility would be managed to maximize income from grazing fees. There would be no economic interest in overgrazing, depleting the resource, since any form of degrading the grazing commons would reduce the value of the utility to its owners, the people of the grazing commons and investors.

Hawkin points out that "utilities are hybrid enterprises because they combine two unusual features. First, they are regulated by their constituencies through public utility commissions or other forms of public sector input. In return for accepting regulation, they are given monopolies and are guaranteed a certain level of profit."[23] This public-private relationship allows them to create and implement long-term projects that better the resource, and attract capital while paying low interest rates.

Unfortunately, utilities have a less than stellar reputation due to cases of mismanagement. Most notable has been the construction of nuclear power plants with escalating and hidden costs never adequately communicated to investors or the public. In recent years, reputations have changed when power utilities discovered that it was far less expensive to invest in technologies that save energy for the consumer than in new coal or nuclear-fired power plants. Conservation rebates developed by power utilities might also be useful for other utilities as a means to lessen our impact on natural resources while increasing overall productivity and social values.

Ironically, these utilities are increasing productivity by not growing. A forest utility would be an attractive approach to consider if it could increase responsible timber management and productivity value, not necessarily board-feet of lumber produced, without also growing the perception that forests are being lost to excessive cutting and erosion. Clearly, it is not in the interests of most Massachusetts forest owners to exploit their land. Instead, landowners hope to achieve some prosperity through their stewardship of forests, without significant changes to the landscape.

The purpose of a forest utility would be to preserve forests, increase revenue from forests, and to facilitate responsible forestry by landowners, most especially owners of small and modest forest lands. A fee on timber cut or forest products sold would support the forest utility. Revenues would go directly to the forest utility or to regional sections within the area managed by the forest utility. To meet its purpose the forest utility would spend its funds primarily on habitat restoration, education, and research. As a utility, it would be allowed a guaranteed profit depending on performance. Like a power utility, the forest utility would issue stock. Given its guaranteed revenue flow from the timber fee, it would also have the capacity to issue bonds at favorable interest rates. Bonds would be used to invest in long-term forest restoration projects. As a corporation, the utility would be required to invest eighty-eight to ninety percent of its revenue on a yearly basis in forest restoration and education. A separate nonprofit organization could be established to receive charitable donations and bequests. The nonprofit organization would work closely with the utility on education and public relations. More than the utility, the nonprofit organization could run interpretation programs and raise funds for forest conservation, restoration, and preservation.

The forest utility would not have the power of eminent domain. Therefore, it would not pose a threat to any agency or constituency. It should enforce existing laws, and work in a collaborative and cooperative basis with the National Fish and Wildlife Refuge system, state and municipal environmental agencies, environmental advocacy groups, recreational/sporting groups, businesses, and local chambers of commerce. Increased revenues from forests combined with increased restoration and preservation of forest would be a boon for local communities, tourists, recreational, and environmental users.

The long-term benefit of a forest utility would be to diminish what has been the ever increasing development and urbanization of forestlands. The benefit is restoration and preservation of forests, and a more responsible economic valuation of forestlands that is much more than simple summations of the short-term opportunities. A forest utility could have many spin-off benefits. Landowners with hardwoods that would be of interest to furniture and instrument makers could sell before-harvest shares in the sought after woods. Farmers in "community-supported agriculture" (CSA) programs are successfully using this method to acquire much needed working capital. Consumers buy a share in the fall harvest at the beginning of the season and then collect shares of produce weekly. Exactly how many vegetables they receive each week depends on the harvest at that time, so that farmers and consumers share the risks of weather and other hard –to predict events. These advance purchases, finance the farmer's work of bringing in the harvest, while the consumer is assured of organic produce at a reduced price.

Companies and institutions, such as colleges, are looking at ways to save money and reduce environmental degradation in energy production. A new emerging technology, called biomass generation, involves burning wood chips in generators that have managed to greatly reduce smoke emissions, providing for a cleaner energy source. If town foresters could be assured of a reliable market for the results of forest thinning, or logging residues, they would

practice better forest management. A forest utility could help landowners who cut infrequently to find reliable sources for their trimmings, and match their harvesting schedules to market demand. Before committing to the new technology, biomass generator users may opt to pay the utility in advance to be sure of consistent and timely delivery of wood fuel.

For the forest utility to succeed in today's political environment of free-trade agreements, products will have to be of greater quality to justify the increased cost over products harvested without a sale fee, and for other reasons more cheaply, elsewhere. Fortunately, as demonstrated by CSAs and by quality-oriented companies such as Stonyfield Farms Yogurt, an educated public will pay more for quality and for a product they can trust. Success, as stated in the Conte Refuge vision statement, "must depend on the vigilance of an educated citizen." Giving forest landowners and communities a stake in the forest utility should assure a market for the utility's products. Goals are met and civic pride in forests is promoted when forest productivity increases simultaneously with increased forest restoration, conservation, and preservation.

CONCLUSION

Three federal programs by two federal agencies are reviewed above: the Silvio O. Conte Refuge managed by the U.S. National Fish and Wildlife Service; the Quinebaug and Shetucket Rivers Valley National Heritage Corridor; and the Boston Harbor Islands National Park Area managed by the National Park Service in collaboration with its partner organizations and agencies. Along with the idea of a forest utility, these programs all involve public and private interests with varying degrees of control. These experiences and proposals suggest a number of needs, goals, and methods for any new forest stewardship initiative.

The need to prevent habitat degradation, and inappropriate or overdevelopment of land in private ownership was most apparent in the nineteenth-century commercialization of Niagara Falls and early threats to Yosemite. The need to combat fragmentation of lands and ecosystems is demonstrated by the Fish and Wildlife Service and the National Park Service working with organizations to represent "interests" that transcend ownership boundaries toward more bioregional collaborations. There are also forest needs to facilitate responsible private forestry, generate revenue, and reduce regional energy costs. A forest utility addresses these needs more directly than do the three federal programs. For example, biomass energy for colleges and other institutions with clustered buildings would reduce costs while providing both local markets and revenue for forest cuttings and cleanup.

An overall goal is to protect, preserve, restore, and appreciate forests. The Conte Wildlife Refuge demonstrates conservation of biodiversity, wildlife, and habitats. The Refuge goes on further to protect water quality. Goals that forest stewardship has in common with the Boston Harbor Islands include preservation of scenery, compatible recreation, interpretation, and visitor access. The Boston Harbor Islands also demonstrates the importance of citizen pride and celebration of the resource. The Quinebaug and Shetucket Rivers Valley National Heritage Corridor demonstrates the a social justice/quality of life goal of "preserving a way of life."

Participation by citizens, municipal and local interest groups is a vital goal for successful and sustainable preservation of Massachusetts's forests. These goals are met through education, collaborative research, partnership governance, and expertise in multiple areas and at multiple levels.

The three federal programs in Massachusetts reviewed above suggest that the spatial scale of a forest initiative must cross municipal and county lines to be most inclusive and to benefit from the greatest diversity of participants, viewpoints, and experiences. The Boston Harbor Islands National Park Area demonstrates that a federal agency can work effectively within one state. The Heritage Corridor became even more effective when it expanded from Connecticut to include Massachusetts. The Conte Wildlife Refuge has a bioregional goal in the four states of the Connecticut River watershed.

The federal wildlife refuge, heritage corridor, and national park area reviewed here were all legislated by Congress. They were established in perpetuity as "a trust from the whole nation." They excel at long-term planning and far-sightedness. Responsiveness and adaptation of established management practices over time have been demonstrated. These are all reasons for involving a federal agency in the preservation and stewardship of Massachusetts's forests.

The institutions reviewed here suggest a number of methods or tools that might be applicable to forest stewardship. The Conte Wildlife Refuge was the only program to acquire public land from private ownership, primarily one large previously private holding in Vermont. The two other federal programs, and for the most part Conte Wildlife Refuge, succeed without any land acquisition at all.

Cost sharing, especially with state agencies, is important. Matching grants and in-kind contributions for research and education are common. The Boston Harbor Islands also matched grants for environmental remediation and capital improvements. When Congress delayed appropriations to the Conte Wildlife Refuge, programs were sus-

pended for part of 2003–2004. All programs provide technical assistance. A forest utility could also support costs through rebates, issuing bonds, and private investments. The utility would be subject to special public regulation and scrutiny, such as requirements to invest eighty-eight to ninety percent of gross revenue in restoration, education and research.

Public pressure is the primary enforcement mechanism for the heritage corridor. Environmental laws are part of the mandate of a forest utility and are rigorously upheld by the three federal agencies. Methods fundamental to all four programs focus on public participation in planning, management oversight, and monitoring. Public-private partnerships are practiced to varying degrees in all cases. As demonstrated in the Boston Harbor Islands, these practices can build a strong capacity for civic involvement and relatively egalitarian leadership.

Finally, federal programs once had a reputation for centralizing power and control within the federal government. The programs reviewed here have worked hard to reverse that and have moved instead toward more participation by local citizens, interest groups, businesses, municipal and state agencies. Without such a distributive approach to authority, the Boston Harbor Islands National Park Area would not have been created. Given Massachusetts's legacy of town-meeting governance, it is not surprising that this state was the site of the first federal park unit to so thoroughly embrace public-private partnership. Massachusetts's strong spirit of "commonwealth," and the successful practices of three federal programs operating today in the state, strongly recommend a participatory approach to stewardship of Massachusetts's forests, which recognizes and gives voice to the smallest of private landowners along with multiple interest groups and businesses.

NOTES

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THE FEDERAL ROLE IN ADVANCING LANDSCAPE-SCALE, MULTI-OWNER FOREST CONSERVATION AND STEWARDSHIP

Mary Chapman

Author contact information:
Mary Chapman, Manager
The Forest Stewards Guild
P.O. Box 8309
Santa Fe, N.M. 87504-8309
email: mary.chapman@pop.mindspring.com

INTRODUCTION

In creating the United States, the founders of this country established a national social ethic of what it means to be an American citizen. A compelling vision, this ethic permeates how we expect to be treated, how we think of ourselves, and what we consider to be our place among the world's people even to this day. However, despite or perhaps because of the founders' largely agrarian perspective, there is no comparable statement of an American land ethic from that time period. Instead, national policies toward our land and natural resources have focused on the personal and property rights of citizens and landowners, with much less emphasis on the responsibilities that accompany and validate those rights. However, natural resource management and environmental issues are now emerging more frequently at a regional level. These issues need to be addressed on a landscape scale, involving multiple land ownerships and jurisdictions. Examples include forest health concerns, as well as watershed protection and management. These trends point to the need for a more active, expanded federal role and investment in forest conservation and stewardship, on both public and private lands.

THE EARLY FEDERAL ROLE IN CONSERVATION: PRESERVATION

With the western edge of the new nation carved out of the wilderness and a vast unknown beyond that, with a seemingly limitless supply of land and natural resources, perhaps the founders saw no need for a land ethic. Aside from missions of exploration during the nineteenth century, most attention to land and natural resources centered on how to tame the land and its native inhabitants, and how to use natural resources more efficiently.

Improved transportation and communication systems in the late nineteenth century exposed eastern citizens to the wonders in their western backyard. At the same time, many could see all around them resource degradation resulting from poor agriculture, forestry, and mining practices. The concept of the federal government as steward of natural wonders and resources emerged with the establishment of Yellowstone National Park as the first national park in the world, an action cited by Levitt (2002) as a landmark conservation innovation. This act inaugurated the still vibrant debate on the federal role in American natural resource conservation and utilization.

THE FEDERAL ROLE IN CONSERVATION EXPANDS: PRESERVATION AND UTILIZATION

Initially the federal role was expressed through public land ownership by the federal government. The Forest Reserve Act of 1891 provided President Harrison the authority to establish forest reservations from public domain lands. Department of the Interior field inspections recommended lands to be included in these reserves. The Forest Management Act of 1897, also known as the Organic Act, established management provisions and funding for administration of the reserves under the General Land Office in the Department of the Interior. The act redefined the purpose of the reserves as forest protection, watershed protection, and assuring a timber supply for the nation.

In 1905 Congress transferred the forest reserves from the Department of the Interior to the Bureau of Forestry within the Department of Agriculture, signaling an emphasis on the role of these lands in providing a continuous supply of timber and other natural resources. The Bureau of Forestry was renamed the Forest Service, headed by Gifford Pinchot as Chief Forester. Pinchot drafted instructions on managing the reserves, stating that "All of the resources of the forest reserves are for use . . . under such restrictions only as will insure the permanence of these resources."[1] These regulations were first published in 1905 as *The Use Book*. *The Use Book* established the framework of forest

resource utilization on reserve lands governed by the Secretary of Agriculture's ability to "permit, regulate or prohibit" various uses, such as grazing and timber sales. This authority was to be applied in such as way as to gain the cooperation of reserve users by earning their respect.[2] The Department of Agriculture's tact directly contradicted the General Land Office approach, which focused on protecting the reserves by forbidding uses such as grazing. As might be expected, the Land Office approach created immense ill will with local residents. In 1907, the federal forest reserves were renamed national forests, to correct the misimpression that these lands were withdrawn from use.

UNFULFILLED VISIONS OF A COMPREHENSIVE POLICY FOR ALL OF THE NATION'S FORESTS

Gifford Pinchot, a Connecticut Yankee, returned to the United States in 1890 after studying European forestry methods. Rapid and extensive forest destruction on private and public lands awaited the first American forester. Guided by his belief that "the care of the forests is the duty of the nation,"[3] Pinchot set about stemming the degradation by applying the science, practice and art of forestry to the nation's forestlands. To Pinchot, "the purpose of Forestry, then, is to make the forest produce the largest possible amount of whatever crop or service will be most useful, and keep on producing it for generation after generation of men and trees. And the more you think about the services of the forest, the more you understand them, the more essential they appear."[4] In *The Use Book,* he advocated forest management in which ". . . the forest officer is allowed to use his head" to ensure that ". . . the welfare of the forest must come first. Forestry must actually be applied."[5] *The Use Book* added resource management and utilization decisions on public lands, guided by science and a land ethic, to the scope of the federal role in natural resource policy.

Before bringing this philosophy to the public lands in national forests, in 1898 Pinchot had offered forestry services on private lands, including the Biltmore Estate in North Carolina. In the years before he was named Chief Forester, Pinchot came to the conclusion that ". . . only Federal control of cutting on private land could assure the Nation the supply of forest products [it] must have to prosper. . . . That the United States will eventually exercise such control is inevitable because without it the safety of our forests and consequently the prosperity of our people cannot be assured."[6] President Teddy Roosevelt shared this view of the role of the federal government in private forest conservation and management. Pinchot and Roosevelt worked to implement a comprehensive national forest policy that applied to both public and private forests based on the land ethic that ". . . the welfare of the forest comes first,"[7] but they were not successful. Nonetheless, their vision marks a clear evolution in federal natural resource policy from protection of natural wonders through public acquisition, to include public land resource conservation and utilization guided by science and a land ethic, and advocating a national interest in the application of those same guidelines to private lands.

As management of national forests in the West improved through implementation of *The Use Book* guidelines by Forest Service employees, attention turned to the East. Poor logging practices that severely degraded stream water quality and navigability were widespread, and especially visible in New Hampshire's White Mountains. The Weeks Act, passed in 1911, authorized the federal government, following state authorization, to purchase lands for stream-flow protection, and to maintain the acquired lands as national forests. By enabling the Forest Service to purchase land outright, national forests were no longer restricted to existing public domain lands, which were uncommon east of the Mississippi, and the eastern national forests were established. The Weeks Act also formalized public-private cooperation and marked the beginning of federal forestry assistance programs, largely for fire protection. In the wake of the fires of 1910, cooperative fire protection was quite popular. As more states competed for available funding, there was increasing pressure to move toward a national forest policy and to increase funding for a broader range of cooperative projects.

The underlying argument for increasing funding of cooperative projects was that private landowners could not carry the burden of fire protection and reforestation alone. Since the public had an interest in promoting forestry on private lands, because it protected water quality and maintained wood supplies, the public should also share some of the cost. In response to this need, in the early 1920s the Forest Service stepped up its efforts to assist small woodlot owners. State extension services were identified as a resource for delivering forestry information to landowners throughout the country, since they were generally in every county — a system still in place today. Public pressure ultimately led to the passage of the Clarke-McNary Act of 1924. This act was the first federal measure that signaled a move from public to private forestry. It authorized tree planting and farm forestry assistance to private landowners, in an effort to go beyond fire management to forest management. The Clarke-McNary Act also authorized purchases of forestland for timber production, in addition to stream-flow protection, extending the reach of national forest land purchases into the Lake States region. Although the Clarke-McNary Act started from the hope of establishing a national forest policy, in the end it was not really successful in achieving that goal. Instead, the act became mostly a fire

protection program, and the vision of a broad federal role in private forest management was not fulfilled.

The 1924 Clarke-McNary Act was followed in 1928 by the McSweeney-McNary Act, which established experiment stations and a research program to provide scientific knowledge and conduct practical studies of reforestation. With these two acts, the conservative federal forestry role was in place. The federal government did not order the landowners to conduct themselves in the public interest. Instead it provided knowledge, tax and other financial incentives, and public timber to elicit desired public goods from private actors.[8]

Since the 1920s, direct federal involvement in developing forest practice regulations for nonfederal lands has been minimal. Federal agencies have assisted states in developing and enforcing varying levels of recommendations or legislation for the practice of forest management. Most forest management regulation and enforcement relates to protecting water quality, retaining threatened and endangered species habitat, and redressing timber theft. However, no federal permitting process, legislation, or requirement governs the quality of forest management practices recommended and implemented on nonfederal lands. And there are no federal standards measuring how those practices affect the long-term health of the residual forest ecosystem.

NATIONAL FOREST POLICY EVOLVES

Policy for the national forests has continued to evolve, largely in response to increased environmental concerns related to public land management. The Multiple-Use Sustained-Yield Act of 1960 broadened the purposes of the national forests to include outdoor recreation, range, timber, watershed, and wildlife. The act directs the Secretary of Agriculture to administer renewable surface resources on the national forests for multiple use and sustained yield. The National Forest Management Act of 1976 reorganized, expanded, and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands. The National Forest Management Act requires the Secretary of Agriculture to assess forestlands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the national forest system. It is the primary statute governing the administration of national forests.

NONFEDERAL FOREST POLICY MAINTAINS ITS APPROACH

On the other hand, Forest Service policy toward private forests has continued to focus on providing technical and financial forest management assistance to private landowners on demand. Following the Clarke-McNary Act, the next successful legislation to address the federal role in private forest management was the Cooperative Forestry Assistance Act of 1978. The act expanded the range of programs available to private nonindustrial landowners, to include urban forestry and a broader forest health and stewardship focus. However, it generally relies on the same tools as the Clarke-McNary Act of 1924: technical and financial cost-sharing assistance delivered through state forestry agencies and state cooperative extension services. Although these tools are appropriate for reaching some landowners, despite many years of implementation, the level of participation in landowner assistance programs and the percentage of landowners developing forest management plans to guide their activities remains low. Birch (1996) estimated that as few as five percent of all private forestland owners in the northeast have forest management plans, although together they own twenty-nine percent of the region's forestland.

A NEW OPPORTUNITY FOR A COMPREHENSIVE NATIONAL FOREST POLICY?

The nation's duty toward its forests, recognized by Gifford Pinchot and Teddy Roosevelt at the turn of the last century, is even more critical now as the U.S. population continues to grow and more people live in forested areas, often with mixed public-private land ownership. To maintain ecological health and function, reduce wildfire risks, maintain water quality, and provide a steady source of forest goods and ecological services, a comprehensive approach across ownerships is needed. Not only does public forestland resource conservation and utilization need to be guided clearly by science and a land ethic, new approaches are needed toward private forestland as well. When the human population was dispersed, so were the impacts of people's activities. Generally, natural systems could absorb these impacts with little long-term negative effect. However, as population densities increase so does the competition for natural resources and services, such as outdoor recreation and the capacity for both water filtration and production. The local, regional, national, and international impacts of our individual and collective activities loom larger.

OPEN SPACE PROTECTION IN THE FACE OF LAND CONVERSION: ACQUISITION AND EASEMENTS

The recognition that the American frontier was shrinking, and that people could no longer count on being able to move away from human influences on natural systems,

helped lead to the establishment of the Land and Water Conservation Fund (LWCF) to supplement traditional agency land acquisition funding. Created by Congress in 1964, the LWCF provides funds to federal, state, and local governments to acquire land, water, and conservation easements on land and water for public benefit. Program funding comes primarily from revenues received from offshore oil and gas drilling. The LWCF helped to reshape the federal role toward private land by introducing less-than-fee-simple land acquisition at the federal level, and advancing the notion of land ownership as a bundle of rights that could be valued and exercised separately.

The Forest Legacy program, established in the 1990 Farm Bill, implements the concept of land ownership as a bundle of rights with respect to forestry and forestland. The program, which has recently experienced a significant funding increase, focuses federal easement acquisitions on working forestlands within areas designated by states that elect to participate in the program. States also hold these easements, although there is pressure to enable other organizations to hold them as well. The purpose of the Forest Legacy program is twofold: to protect open space and to ensure that landowners can continue to practice responsible forestry. In addition to extending the federal use of conservation easements specifically to working forestland, the program also has drawn attention to the challenges of designing and monitoring both easement terms and land management plans that require active forest management. Easements were originally designed to prevent development or other specific changes in land use. Their effectiveness in guiding land management practices to achieve desired conservation outcomes has been mixed. Nevertheless, the Forest Legacy program is an important step in affirming the federal role in open space protection and responsible forest management, and is considered an important forest protection tool in present and future conservation efforts.

The value that Americans place on protecting open space has continued to increase with the sense that special places are being lost to development. The breadth of concern about conserving open space is apparent in the growing support of voters for local and state land open space conservation funding. According to the Trust for Public Lands (TPL) and the Land Trust Alliance (LTA, reported in 2003), fully seventy-five percent of all local and state conservation-related funding ballot measures passed in 2002: of 189 measures on the ballot in twenty-eight states, 141 passed. These measures generated $10 billion in conservation-related funding, either through dedicated taxes or bond issues. This figure includes an estimated $5.7 billion specifically for land acquisition and restoration. These results make clear that Americans care so deeply about open space, parks, and special places that they will raise their own taxes to protect them.

However, even all of this open space protection activity does not keep pace with the rate of land conversion from open space to developed uses, let alone prevent poor land management or actively restore ecosystems. As land prices escalate, it becomes more difficult to achieve landscape-scale conservation objectives through public or fee-simple ownership alone. The feasibility of fee acquisition must be weighed carefully to determine how much control over land use is required to achieve the conservation objectives to be served. This cost consideration extends not only to initial land acquisition, but to long-term stewardship as well. Clearly, people want to protect many beautiful, special places that aren't of high conservation significance but nonetheless provide important conservation values such as water and air filtration, human respite, wildlife habitat, and other forest products. Rather than investing fee acquisition dollars in places like these, perhaps cooperative public-private land conservation and stewardship models would be appropriate; enabling the current landowners to retain ownership while sharing with other citizens the costs and benefits of maintaining healthy ecosystems capable of providing the ecological goods and services on which we all depend.

RE-EVALUATING THE FEDERAL ROLE IN LANDSCAPE-SCALE CONSERVATION

Choosing the cooperative path provides the opportunity to expand the federal role in private land conservation beyond both protecting land through acquisition, and providing technical and financial assistance on demand to individual landowners. In this cooperative model, the federal role could include providing technical and financial support to groups of landowners who pursue broader conservation goals through shared forest management on an ecosystem, landscape or regional scale. Since impacts to public goods are rarely confined to the property of the landowner on which forest management is being implemented, federal involvement with initiatives like these would signal a deepening recognition of the national interest in the public impacts from forest management outcomes on private lands.

COOPERATIVE LANDSCAPE CONSERVATION AND MANAGEMENT MODELS ON PUBLIC LANDS

Cooperative models are being tried on public lands. The national forest planning process and the National Environmental Policy Act have led to numerous examples of outside groups being invited to provide federal land

managers with advice, and to participate to varying degrees in decision making about land management, planning, and implementation. Additional approaches include

- Adaptive Management Areas, which aim to incorporate the results of ecological monitoring into forest management activities more quickly;
- Charter Forests, an initiative intended to enable local governing organizations to manage portions of national forests;
- and the Valles Caldera National Monument, a National Forest unit whose public-private management trustees are charged with paying for its continued stewardship with revenue generated from the land.

However, these experiments are being implemented on public lands. The Forest Service still most commonly views itself contributing toward landscape-scale conservation goals through the current national forest model of working towards federal fee ownership and public natural resource management within forest proclamation boundaries.

COOPERATIVE LANDSCAPE CONSERVATION AND MANAGEMENT IN AREAS OF PRIVATE LANDS AND MIXED OWNERSHIP: PERSPECTIVES AND MODELS

The Forest Service remains cautious about its role in non-federal forestland management. Conversations with several Forest Service officials indicated that they thought it would be hard to overcome perceived public concern about "a hidden agenda for a federal land acquisition" if they were to initiate discussions of alternative forestland ownership, easement, or management roles for the agency. These officials expressed a preference for waiting until such an idea is raised by a state forestry agency, following the basic model established by the Weeks Act of 1911, to assure them of public support for Forest Service involvement.

However, with increasing public interest in open space protection, the need to respond to regional environmental issues, and continuing deeply held beliefs in the rights of private landowners, new approaches to conservation are emerging. Schelhas (2003) cites McCay's (2000) argument that ecosystem management is a manifestation of this new approach to natural resource management, which reflects cultural changes of the late twentieth century. McCay describes the tenets of ecosystem management as follows:

1. utilitarian values existing alongside less anthropocentric values such as biodiversity and ecosystem integrity;
2. a tendency to look at whole systems, and to view them as non-deterministic (i.e., capable of complexities, discontinuities, and surprises);
3. scientific uncertainty creating openings for other sources of knowledge, ranging from traditional knowledge to junk science;
4. formalization of uncertainty into science-based management models, such as adaptive management;
5. recognition of the importance of local and user knowledge, through bottom-up and collaborative approaches; and
6. people as active participants in the systems, for example as monitors and managers.

In 1992, Ticknor proposed a cooperative forest management model that recognized the emergence of ecosystem management as a foundation for forest management strategies. He suggested that although the forestry community was making headway in considering how to factor into forest management elements such as biodiversity conservation, aesthetics, maintaining water and air quality, providing recreational opportunities, carbon sequestration, and preserving the character of forests and landscapes, along with commodity production, it was lagging behind in:

1. developing systems models that capture the interactions and trade-offs among different social, biological, and environmental alternatives, and
2. creating social institutions to coordinate resource management across geographic, political, and ownership boundaries at each of the several scales of activity that the new forestry requires.

In suggesting that there is a need for new institutions and for a new decision dynamic, Ticknor pointed specifically to regions as the critical scale for establishing the awareness, vision, and implementation of forest management needed to address many environmental and land management issues.

Ticknor summarized the functions of a regional ecosystem management organization in six categories:

1. communication and facilitation of dialogue among diverse interest groups;
2. education;
3. information gathering and analysis;
4. interpretation . . . translating regional objectives to community practice, global objectives to regional practices, and so forth;
5. a repository of expertise;
6. administrative support and "sponsorship" — spark and energy to keep ideas alive.

The Forest Ecosystem Management Council Ticknor envisioned to fill this regional role is not well-defined, except that it is not a traditional public agency delivering a program to individual private landowners. It seems reasonable to conclude that such a council would have public and private members to implement its mission of voluntary land management coordination, given the author's strong belief that ecosystem management programs should depend on voluntarism rather than control. Ticknor did not discuss the potential need for land ownership change, such as public land or easement acquisition to achieve regional goals established through an ecosystem management council. His analysis and recommendations, applied in at least one case in Indiana, have not been implemented at the national level.

National forest policy toward nonfederal forestland was prominently addressed when the National Research Council (NRC) of the Academy of Sciences published the results of a study about the prospects and opportunities for sustainable management of America's nonfederal forests. The 1990 Farm Bill called for a Presidential Commission on State and Private Forests, to conduct a study of nonfederal forestlands. The Commission was never convened, but the study was funded and completed in 1997. NRC study authors described the following elements in the evolving federal role towards nonfederal forestland:

1. Convening and promoting leadership and investment opportunities within the private sector and other units of government.
2. Building institutional and managerial capacity within regional, state, and local forestry organizations.
3. Promoting the integration of environmental and economic policies and programs.
4. Developing a coherent set of national principles of forest resource sustainability.
5. Fostering strategies that lead to regional integration across a spectrum of forestry interests.
6. Promoting a blend of economic and information incentives.
7. Encouraging multiple stakeholder decision making processes at all decision levels.

The authors concluded that these elements implied a manageable number of government programs and policies that promote long-term investments and respect the mixture of public and private ownerships that comprise the nation's nonfederal forests. These conclusions foreshadowed the tenets of an ecosystem management approach to natural resource policy described two years later by McCay (in Schelhas 2003).

After confirming the federal role toward nonfederal forestland conservation and management, the NRC study analyzed current social, economic, and natural resource factors influencing nonfederal landowners and federal forest policy. Study authors identified several challenges to future public investment in the sustainability of nonfederal forests:

1. Promotion of public and private resolve, and commitment to ensuring the long-term fundamental health and integrity of forest ecosystems that make up the nation's nonfederal forests.
2. Development of national policies and programs for nonfederal forests that are grounded in a comprehensive policy for the nation's forests (these policies should clearly reflect the important contributions of nonfederal forests to the nation's well-being).
3. Improvement of coordination and simplification of existing federal programs for nonfederal forests, and the fostering of cooperation among the many public and private partners with interests in nonfederal forests.
4. Strengthening of federal assistance and protection programs for nonfederal forests, and encouragement of innovative approaches to emerging issues involving the use, management and protection of nonfederal forests.
5. Reinforcement of the information base on which informed decisions can be made about the use, management and protection of nonfederal forests, and improvement of the transfer of information to owners, managers, and citizens with interests in nonfederal forests.
6. Encouragement of economic conditions and innovative programs that will result in high levels of investment in sustaining nonfederal forests (the levels should be consistent with the benefits provided by nonfederal forests).
7. Enhancement of the ability of nonfederal forests to provide important economic, social, and environmental contributions in a global context to the world community.

The NRC study defined seven program components, seven broad recommendations and twenty-one specific recommendations to guide federal program and policies that contribute to the sustainable management of nonfederal forestlands. However, the study did not formally suggest ways to implement these recommendations.

While not included in the final study report, an excerpt from the preliminary report suggested one such implemen-

tation model (Ross, 2003). The concept, known as Private Forest Regions, is based on the premise that federal and state support of private stewardship for the sustainable management of nonfederal forests can be accomplished by encouraging informed and responsible landowners to be good stewards, without ineffective and irregularly applied regulation. Private Forest Regions would be established, at local request, as a functional program delivery system for landowners and others within the designated region. Regions would receive designation by the U.S. Forest Service's State and Private Forestry division, after sufficient requests have been made and the proposed region's ecological significance has been evaluated and documented. Once designated, the region would qualify for federal funding of GIS-supported planning services to identify wildlife habitat, forest cover types, productivity of soils, diversity of plant species, recreational opportunities and demands, timber supply and demands, and other conditions. Participation would be voluntary, and incentive programs would be tailored specifically for each designated region. Projects would involve collaborative management, and the proposal envisioned the role of the federal government primarily as educator, information source, facilitator and guarantor of programs and actions carried out by others.

To implement the NRC study recommendations, Rains (1998) developed a strategy entitled: *Nonfederal Forestland Stewardship: A Conservation Initiative for the Twenty-first Century*. The initiative envisions an expanded federal partnership role with states, containing these attributes:

1. leading-edge technical assistance;
2. strong state forestry programs;
3. targeted financial assistance;
4. reducing federal investments over the long run (prevention is less costly than mitigation);
5. monitoring and assessment of forest sustainability trends;
6. information clearinghouse.

Such a partnership initiative would have several purposes:

1. help ensure healthy, productive sustainable forests through stewardship planning, forestry incentives and technical assistance;
2. reduce forest fragmentation;
3. protect lives and property from wildland fire, particularly in wildland-urban interface zones and by providing assistance to volunteer fire departments;
4. help improve the quality of living conditions in urban areas through the management and restoration of urban natural resources;
5. improve the compilation and analyses of timely, accurate information; and
6. bring people and communities together to help solve local problems and develop new opportunities.

Although the Forest Service did not pursue this initiative, together with the NRC study it did advance thinking among public forest policy officials about the federal role and investments in the stewardship of nonfederal forestland.

A prominent supporter of the NRC study and its view of a more active federal role in promoting nonfederal forest sustainability is the National Association of State Foresters (NASF). In a 2002 policy statement, NASF presented its views on the future of the State and Private Forestry programs of the Forest Service, and the implications for these programs of the recommendations of the NRC study. As authorized by the 1978 Cooperative Forest Assistance Act as amended, State and Private Forestry programs are the Forest Service's major tools for working in partnership with the state foresters and others to encourage sound management of nonfederal forests. NASF supports using a non regulatory, voluntary, incentive-based approach to provide forest management assistance to private landowners. The federal government is viewed as an active participant in assisting landowners to accomplish their land management objectives while achieving public benefits such as the long-term health of watersheds, wildlife and fisheries conservation, stabilization of rural economies, and support for a major sector of the national economy. NASF highlights two other attributes of the federal role in nonfederal land conservation. First, the state foresters note the importance to the federal government of working with nonfederal landowners in protecting imperiled species by providing incentives and assistance, rather than regulation, since ninety percent of endangered species have all or part of their habitat requirements met on private forested lands. Second, they state that federal programs should add value to private property by fostering investment through incentives, an appropriate tax policy, and protection of forest resources.

In a nod toward a comprehensive national forest conservation and stewardship policy, NASF points out that successful implementation of the NRC study must be reflected not only in the U.S. Forest Service's State and Private Forestry programs and budget line items. The federal government must promote Forest Service leadership on all forestry issues, and existing partnerships between the Forest Service and state foresters must be strengthened and supported. While no new programs are suggested, NASF calls for encouraging responsible stewardship of

nonfederal forests through additional investments and coordination with other USDA agencies, including the Cooperative State Research, Education and Extension Service, and the Natural Resources Conservation Service.

COOPERATIVE LANDSCAPE CONSERVATION AND MANAGEMENT IN AREAS OF PRIVATE LANDS AND MIXED OWNERSHIP: ONGOING PROJECTS

New York City Watershed

A fresh vision of the value of public-private cooperation, as well as plain common sense economics, was instrumental in providing technical and financial assistance to enhance stewardship on the largely nonfederal lands of the New York City watershed in the Catskills. Directed by a state-level organization with local and federal input, this $1.6 billion investment in protecting water quality largely retained traditional private ownership patterns while avoiding an estimated $11 billion investment in water treatment facilities. Efforts continue to maintain the value of these investments in private land stewardship, in order to protect water quality.

The Highlands of New York and New Jersey

In 1990, the Forest Service was invited to conduct a study of land use, economic and ecological impacts, and citizens' visions for the Highlands area of northwestern New Jersey and the southwestern tip of New York. The area serves as the watershed for 15,000,000 people in Connecticut, New Jersey, New York, and Pennsylvania, but despite its proximity to New York City, its inaccessibility has kept it lightly populated. However, planned interstate highway construction and increasing population were projected to escalate development pressures in the region. The goal of the study was to recommend strategies for long-term regional land stewardship. The study was completed with federal funding and federal and state staffing, and helped develop cooperative efforts among agencies and nongovernmental groups who had previously worked quite independently in the region. Ecological, economic, and social data and trends were collected and analyzed to develop land-use recommendations, which were vetted by citizens at a series of meetings around the region. The study was revisited and updated in 2002, and resulted in the introduction of the Highlands Stewardship Act in the House and Senate in May 2003. The legislation calls for establishment of the Highlands Stewardship Area, some 2,000,000 acres stretching from northwestern Connecticut through New York and New Jersey to eastern Pennsylvania. Significantly, the act establishes the Office of Highlands Stewardship within the U.S. Department of Agriculture to advise the four states' governors and the federal Secretaries of Agriculture and the Interior on implementing study recommendations, land conservation partnerships for the region, research needs, and policy and educational initiatives. While the office is specifically intended not to effect state or local governments' control of land uses, it does provide a direct method by which the federal government can be involved with targeted land conservation and management strategies in a region where there is little federal land. The bill authorizes $2,000,000 for the Office of Highlands Stewardship for each of fiscal years 2004 through 2013, while $25,000,000 is authorized each year over the same time period to fund a federal share of up to fifty percent for acquiring land in-fee or easements through conservation partnerships.

COOPERATIVE LANDSCAPE CONSERVATION AND MANAGEMENT IN AREAS OF PRIVATE LANDS AND MIXED OWNERSHIP: POTENTIAL PROJECTS

Chesapeake Bay Watershed

The continuing decline in quality of the Chesapeake Bay ecosystem has been of concern for many years. Efforts to improve water quality in tributary streams and to reduce or manage storm water runoff, conducted independently at the local and state levels, may have slowed the rate of decline but have not improved conditions. The governors of states within the watershed have now made joint commitments to achieve targets for improvements in water quality, sedimentation, and nutrient and storm water runoff. While there is some state and local public ownership of lands within the watershed, there is relatively little federal ownership. Since 1995 the Forest Service has maintained an office in Annapolis, Maryland, to coordinate technical and financial assistance to private landowners within the watershed, to help develop and implement forest management practices and enhance water quality.

These efforts have been supported by Maryland's two senators, who see a larger role for the Forest Service, with other federal agencies, in a regional approach to improving the ecological health of the Bay and its watershed. They would like the Forest Service to conduct a study of the Chesapeake Bay watershed similar to the New York–New Jersey Highlands Study, to develop broad regional land-use conservation and management strategies that go beyond coordinating individual state efforts. They envision a network of conservation land and easements, building from the remaining large blocks (5,000 acres and up) that are held and managed for riparian and water quality protection

by various federal, state, and local agencies and nongovernmental organizations. Which pieces would be held and managed by which agency or organization depends on the tools each has available and their management focus and capacities. The senators believe that region is too large and diverse for all conservation land to be held by any one agency or organization. They envision a mixed ownership system of noncontiguous properties held by federal, state, and local agencies and organizations and nonfederal owners, which would manage their land in a coordinated way to enhance water quality and the health of Chesapeake Bay. The Maryland Department of Natural Resources has mapped areas significant to water quality protection that are currently under protection or that they want to protect. Some officials believe that high public interest in the health of Chesapeake Bay and in land protection in this rapidly developing state would lead communities to bid to have the Forest Service, Park Service, or Bureau of Land Management acquire nearby prioritized tracts, because of their potential to draw visitors to well-managed, protected lands. Such an influx of federal land and easement acquisition and management assistance would also supplement shrinking funding from the financially strapped state. The senators' interest in Forest Service involvement in the Chesapeake Bay region stems from the agency's public land-management expertise, its experience in providing technical and financial assistance, and its ability to work at a regional level. They also see the Forest Service developing and maintaining a visitor's center in a forested area of the watershed that would serve as the hub for forest protection and management activities to enhance water quality and reduce nutrient and sediment runoff. The Senators do not see the need for new federal programs at this time, but stress that focusing on those already in existence on higher priority regions and issues would be a better investment of resources. No legislation has yet been introduced.

Interestingly, it is believed that in Maryland, in contrast to areas such as western Massachusetts, willing Maryland forestland owners would rather sell their land outright than sell an easement. One reason for this may be that forestland in western Massachusetts is more likely to be under active management, with the prospects for future forest management fairly positive if the landowner chooses to do so. In a rapidly developing area like Maryland, the likelihood that forestland is actively managed is probably diminished due to a stronger tradition of row crop agriculture, smaller tract sizes, higher land values, and a loss of forest management infrastructure.

Southern Cumberlands of Tennessee and Alabama

When the Doris Duke Charitable Foundation chose the southern Appalachians as one of its focal regions for accomplishing landscape-scale conservation, the foundation awarded The Nature Conservancy a multi-year grant to develop and implement a strategy to achieve this goal, working with regional, state, and local agencies and organizations. One of the subregional areas identified as important to accomplishing the broader goal is the southern Cumberlands in southeastern Tennessee and northeastern Alabama. Several large tracts of forestland in private ownership remain in the area, and most of the rest of the land is in smaller tracts, also privately held. Interestingly, in 1975 this area was evaluated as a potential national forest. A joint study team from the Cherokee National Forest in Tennessee and the national forests in Alabama developed a proposal for a national forest on the Cumberland Plateau of Alabama and Tennessee. The study cites interest from the Top of Alabama Regional Council of Governments and the South Central Tennessee Development District in establishing a national forest to "retain its forested condition" what was at that time "the least developed area in the southern end of the Cumberland Plateau and Mountains physiographic region."

This proposal has not been implemented, and does not seem to be under active consideration by the Forest Service at this time. However, Nature Conservancy staff views public ownership — preferably by the Forest Service — as the best eventual status for the remaining large forested tracts under single private ownership. They expressed an interest in the concept of an area with mixed public-private in-fee and easement ownership, across which forest management might be coordinated with technical and financial assistance. Citing strong beliefs in private property rights and a general distrust of government among local landowners and residents, they thought such a model might well serve the long-term forestland conservation and stewardship needs of the region.

CONCLUSIONS

Although the United States was founded as a nation with a strong social ethic describing citizens' rights and responsibilities toward others, no American land ethic was simultaneously made clear and inspiring. Our land ethic has emerged mostly as an expression of landowner rights over their land, frequently considered to this day simply as a form of property. Although land ownership also entails responsibilities, those responsibilities are much less explicit. Because of its mandate to protect common goods, benefits, and services, the federal government shares responsibility and a role in land conservation and environmental quality.

Resource degradation as a result of poor-land manage-

ment practices mobilized early conservationists to enact legislation that has guided public policy to this day. Throughout the late nineteenth and much of the twentieth century, the federal role in land and forest conservation consisted of protecting specific sites and resources through public-fee acquisition and management, and providing technical and financial assistance to individual nonfederal landowners through state agencies. The late twentieth century's

- rise of environmental consciousness;
- increased understanding of the complexities of natural systems and awareness of what we don't know about them;
- growing emergence of regional environmental issues;
- and greater concern about open space protection as land-use conversion accelerates.

has made the early twenty-first century a good time to re-examine the federal role in forestland conservation and management, as part of defining a national forest policy that covers both public and private lands.

The federal role in forestland conservation and management is evolving in response to changes in the public's attitudes about environmental issues and expectations of federal land management, their great access to better biological and administrative information, new ideas about land ownership rights, the recognized value of local knowledge in developing and implementing management strategies, and the need for people to be active participants in the management and monitoring systems. With regard to public land conservation, the federal role remains focused on fee-simple land acquisition and management of key tracts, although easements are growing in popularity as a way to stretch the funds available for land purchases. The federal role in nonfederal land conservation and management is poised for more cooperative efforts with other public, private, and nongovernmental landowners, to develop and achieve shared stewardship goals. This new approach is particularly well suited to addressing landscape-scale, regional, or multi-state issues, problems and opportunities.

The basic attributes of the current federal role toward nonfederal forests remain intact. They include:

1. A non-regulatory, voluntary, incentive-based approach.
2. Close cooperation with state forestry agencies: the basic approach of states requesting federal involvement, established in the Weeks Act of 1911, is well accepted.
3. Providing technical and financial assistance.

Those looking to the federal government for land and conservation leadership expand these characteristics to include a greater emphasis on:

1. Bottom-up approaches, with a high degree of state and local control and perhaps a public-private regional administration and implementation body.
2. Focusing of federal assistance to higher priority regions and issues.
3. Improved methods to enable better program delivery throughout the cooperative programs.
4. Preventive actions to avoid the unnecessary costs of damage mitigation.

The call for federal land conservation and management leadership has also come from state policymakers. In 2001, the National Governors' Association (NGA) expressed concern about the challenges and efficiency of federal management for land in ownership that is fragmented, both spatially and among different ownership types. To address the issue, the NGA called for a national land conservation policy. The NGA Center for Best Practices noted that, despite the many benefits from working lands, no well-articulated policy exists today on what the nation wants from working lands conservation, by what means it will achieve national goals, or how working lands conservation and related policies and activities should be coordinated. A policy that coordinates federal, state, and local conservation goals could help define national priorities and the leadership roles of government at all levels. The current challenge for governors is to help define such a policy, as well as systems to deliver conservation of working lands, that more effectively utilizes the capabilities and resources of federal, state, and local governments.

To achieve landscape-scale forest conservation and management, many groups stress the need to maintain the voluntary nonregulatory nature of the federal role in nonfederal forestland conservation and management. The federal responsibility to protect America's natural resources for the public good may make this approach untenable when private landowners attempt to implement management activities that harm public environmental goods, benefits, and services. In that case, the federal responsibility must override the rights of private forestland owners. The determination of when and how public good is harmed is also at the crux of debates over public land management.

Many groups also stress the need for cooperative multi-ownership land management to achieve landscape-scale forest conservation and stewardship. Finley (2002) conducted a study of the attitudes of private landowners in western Massachusetts about cooperating with other landowners to manage forestland on a landscape scale. The study revealed that the most critical barrier to cooperation

is when landowners' forestland values are satisfied, and they don't perceive any impending threat to those values. Conversely, the most common reason motivating cooperation was to reduce the threat of development. Finley notes that relating the threat of development to landowners' neighborhoods is key to making development a perceived reality, thereby motivating an interest in cooperative action. Landowners also expressed a resounding desire for area-specific information pools and map resources. Some landowners would be motivated to participate in landscape-scale forest conservation and management through incentives and conditions for cooperative activities. Not surprisingly, the most popular incentive among study participants reduces land ownership costs through tax reduction. However it is a surprise to discover that the most unpopular incentive was a direct financial incentive or cost-share from government, which has been the backbone of cooperative forestry assistance since the 1924 passage of the Clarke-McNary Act.

Finley's study concludes that landowners are most interested in cooperative activities to protect local forests from development. Although some landowners, who are already more inclined toward cooperation by nature, may be willing to work with their neighbors on forestland conservation and management to improve long-term forest health and condition, this group seems to be a minority.

The TPL-LTA summary of voter support for conservation funding initiatives on 2002 ballots shows that many citizens share a common interest with the private landowners surveyed in Finley's study: Both groups express a strong desire to protect open space from land-use conversion. It's encouraging that this concern appears to translate into cooperative action and funding for open space and forestland conservation. However, it's discouraging that there has been no factor identified that motivates landowners to cooperate to improve forest health in general across the landscape, for its own sake. To achieve greater environmental good, forest management policy needs to move beyond a dependence on finding ways that landowner and citizen self-interest can be served. An important role of the Forest Ecosystem Management Councils proposed by Ticknor is that they could inspire civic purpose, a goal which could also be served by establishing a national comprehensive forestland conservation and stewardship policy.

One positive sign for cooperative forestland conservation and management is the interest in establishing stewardship areas, to focus appropriate public and private resources on landscape-scale, regional or multi-state issues, problems and opportunities. This approach emphasizes shared governance, mixed ownership, and appropriate land and easement acquisition from willing sellers. It is a promising way to foster cooperative efforts with other public, private and nongovernmental landowners, to develop and achieve common land conservation and stewardship goals beyond individual property boundaries.

The federal role in advancing landscape-scale multi-owner forest conservation and stewardship is legitimate, well-established, and essential. It includes providing inspiration and leadership, wise investment of technical and financial resources, and respectful participation with local and state stakeholders in decision making, to address landscape-scale, regional or multi-state issues, problems and opportunities. Beyond the challenges in implementing these technical elements, Mascia, et al. (2003) provide a timely reminder of why significant advances in and results of natural resource policy are often difficult to achieve, difficult to see, and slow in coming. They write that "although it may seem counterintuitive that the foremost influences on the success of environmental policy could be social, conservation interventions are the product of human decision-making processes and require changes in human behavior to succeed. Thus, conservation policies and practices are inherently social phenomena, as are the intended and unintended changes in human behavior they induce."[9]

POSSIBLE NEXT STEPS BY THE FOREST SERVICE

1. Review existing policy to see whether stewardship area authorization is possible under existing authorities. They need to have the ability to focus and apply existing resources and programs, and establish regional decision making organizations.
2. If these key prerequisites are missing, develop legislation establishing stewardship areas as a way to focus resources and involve local, state, and federal stakeholders.
3. Pursue alternative financing options for acquiring land in-fee and easements, such as open space bonding.
4. Develop more affirmative tools to encourage good land and forest management.
5. Build support for national forestland conservation and stewardship policy, which could be announced in conjunction with Forest Service 2005 centennial celebration.

Forest stewardship initiative goals need to be clear and agreed upon by the stakeholders and participants. Goals will vary according to the place and issues of concern. From the federal perspective, the goals of such a forest stewardship initiative would be to assist in addressing natural resource issues that are too large or complex for indi-

vidual communities or states to address on their own. These may include improving living conditions in urban and rural areas, preventing or reversing resource degradation and fragmentation, and avoiding future costs by maintaining healthy natural systems that can provide clean water and keep forest fuel levels within appropriate limits. The impacts of issues effecting landscapes on such a broad scale are likely to be felt far from the source actions. Protecting the public interest in cases of such broad and distant impacts on human and natural communities, often across local or state boundaries, helps to establish a potential federal role in addressing the impacts' cause(s).

Federal agencies can assist in addressing natural resource issues at the landscape scale because of their capacity and charge to approach such issues from a regional perspective, across ownership and political boundaries. To develop, implement, monitor and adapt effective forest stewardship strategies over the long run, this regional perspective must actively incorporate, not just accommodate, local knowledge of social and ecological systems. These strategies may include public education, cooperative research, cost-sharing to promote specific activities, technical assistance, and information and easement or fee acquisition. Clearly these tools need to be reexamined and delivered in different ways, given low participation in current landowner and technical assistance programs. Fortunately the time to undertake this assessment is at hand. Interest in land conservation, along with awareness and concern over large-scale changes in natural resource conditions, continues to grow. No one entity can provide all of the resources needed to address these problems, providing a powerful incentive to find new ways to conserve natural and human resources.

ENDNOTES

1. Gifford Pinchot National Forest Web site, www.fs.fed.us/gpnf/
2. Pinchot, G., Breaking New Ground, p. 265.
3. Pinchot, op. cit., p. 35.
4. Pinchot, op. cit, p. 33
5. Pinchot, op. cit. p. 276
6. Pinchot, op. cit., pp. 293–294
7. Pinchot, op. cit., p. 276
8. Weyerhaeuser, G. H., Jr., in *Forest Policy for Private Forestry: Global and Regional Challenges,* p. 65.
9. Mascia, et al.

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FROM CONTRACTS TO CONSEQUENCES: HISTORY AS AN ADAPTIVE MANAGEMENT TOOL FOR NATIONAL FORESTS AND LOCAL COMMUNITIES

Alice E. Ingerson

Author contact information:
Alice E. Ingerson, Ph.D.
Applied History for Land
Conservation and Urban Planning
1923 Beacon Street
Waban, Mass. 02468
email: appliedhistory@rcn.com

PROLOGUE: FROM AVOIDING CAPTURE TO MANAGING CHANGE

National forest management has long been a complex game of "capture the forest":

Capture the Forest Rules

- there are two teams: Forest Service vs. everyone else; either team may split up into sub-teams to gain tactical advantage;
- there is only one forest, which starts out in the possession of Forest Service; it can be split up into zones (sub-forests) for defensive or offensive purposes;
- the goal of both teams is to capture as much of the forest, or the Forest Service, as possible (until recently, the Forest Service timber sub-team was frequently captured);
- the Forest Service may use preemptive capture of other teams and their members, as a defense strategy (through grants, incentives, consensus-building . . .);
- all players can lie, cheat, or steal; exaggerate, demonstrate, or litigate;
- anyone who is "tagged" (actually caught lying, cheating, or stealing) while trying to capture the forest goes to jail (at times they may be permitted simply to pay a fine, and sometimes they are in jail only until their teammates can "spring" them);
- the forest, or any part thereof, may be captured and recaptured ad infinitum; the game is only over when both sides run out of time and money.

The following essay mines the history of the U.S. Forest Service and its relationships with local communities for experiences that could be used to play a fundamentally different game, one that has much looser rules but is also much harder to win:

Changing Places Rules

> In the environmental [game], defeats are always final, victories always provisional. What you save today can still be destroyed tomorrow.
>
> —José Lutzenberger,
> Fundação Gaia, Brasil

- there are an infinite number of teams: Forest Service, place-based communities or fractions thereof, national and international interests or fractions thereof;
- there are many different forests, which start out in the possession of many different teams; several teams may also share possession of one forest (some players consider this a form of partial capture, but in most cases it is consensual);
- the goal of each team is to help the forest survive and thrive for as long as possible, by creating changes that serve the interests of the maximum possible number of teams, and by adapting successfully to changes created by other teams; victories are always temporary;
- if a significant number or area of forests disappears or collapses, all teams lose.

Notes:

Epigram from Lutzenberger as quoted in Dowie 1995, p. 175.

The rules for lying, cheating, stealing; for exaggerating, demonstrating, and litigating; and for going to jail are substantially the same in *Changing Places* as in *Capture the Forest*.

Occasionally players propose new rules forbidding litigation, but those rules usually don't last long after they're adopted.

FROM MANAGEMENT-BY-CONTRACT TO MANAGEMENT-BY-CONSEQUENCES

In practice, we are playing *Capture the Forest* and *Changing Places* both at once. But we practice mostly for the first game, and play the second one almost by accident. *Capture the Forest* is played in forest space; but *Changing Places* requires "thinking in forest time" (Foster and Foster 1999).

The overwhelming bulk of writing on forest policy aimed at the broad, political public still focuses on capturing the forest, in whole or in part, for public purposes: through outright or shared ownership, drawing boundaries (critical habitat, areas of environmental concern), or tightening regulation. Many recent experiments in shared ownership have promised win-win solutions, by respecting private property rights and saving public money. But like traditional full public ownership and regulation, they still focus mostly on redistributing land rights and uses in space, and devote relatively little attention to management, follow-through, or evaluation over time.

Robert McCullough notes some of the reasons for this focus on space rather than time, in his comparison between the slow trajectory of New England's town forests until 1970, and the meteoric rise of conservation commissions and land trusts after 1970:

> [In the 1970s] fast-paced technology, multiplying populations, creeping urbanization, and, imperceptibly, a shortening of time itself fostered a malaise of uncertainty. Development . . . became a symptom and conservation the spiritual remedy. Unlike town forests, which demanded consistent management and patient vision, sanctuaries of wildland promised instant reward and gratification (McCullough 1995, p. 299).

In focusing on space at the expense of time, the kinds of conservation that focus on "instant reward and gratification" exemplify what could be called management-by-contract. Management-by-contract has deep roots, but it expanded quickly in the 1970s, as many groups sharpened their skills for the game of *Capture the Forest* by hiring more lawyers, economists, and planners. At the same time, these same nonprofit groups argued that foresters were too narrowly focused on timber production to be left in charge of the national forests, and they urged the Forest Service to hire more lawyers, economists, and planners — which it did (Robinson 1975, pp. 272–73; Shands and Healy 1977, pp. 149–51; Conrad 1997, p. 175). Most training for these professions focuses on achieving goals at a moment in time (capture), rather than on managing change over time. Lawyers write contracts. Economists discount the value of goods and services (as a result, trees that will mature in 100 or more years are often worth nothing at all in the present). Planners map landscapes at single moments in time, either in the present or in some potential future; seldom do they map the process of change that connects these two moments.

In the process of adding these new professions to their teams, many conservation organizations threw the baby of thinking in time out with the bathwater of industrial forestry. Nearly all conservation projects still declare "stewardship" as a primary purpose, yet the "perpetuity part" of conservation is often described in terms that sound more mechanical, legal, or even military than creative, ecological, social, or historical:

- monitoring
- enforcement
- defense

The cumulative counter on every conservation organization's Web site tracks the instant gratification of saving land, adding up acres "saved," rather than the more complex stories of stewardship. In private conversations, nearly all land managers acknowledge this lumpy distribution of time and money and public attention: land acquisition, boundary design, and rights distribution at a moment in time get the lion's share of attention; ongoing management and long-term research get the leftovers. This is particularly true for the newest projects and organizations, including many local land trusts and other experiments in shared land ownership.

Land management efforts that do not begin by questioning the underlying model of management-by-contract often produce just more contracts, or more elaborate ones. Easements are now evolving from relatively short lists of activities or rights withdrawn or conveyed (subdivision, development, clearcutting) into longer and much more detailed lists of activities permitted or even required. One excellent example is provided by the 1999 redistribution of rights over former Champion International lands in Vermont among six new parties: the Vermont Land Trust, the Vermont Agency of Natural Resources, the Vermont Housing and Conservation Board, the U.S. Fish and Wildlife Service, The Nature Conservancy, and Essex Timber. The original contracts for this project were neither simple nor short. The agreement transferring land-use rights to the Essex Company included a clause to distinguish the intended management of these lands for timber production from the management of other project lands for wildlife, scenery, and recreation. That clause quickly became both well-known and controversial as the "forever logging" clause.

In addition to the project's 1999 legislative history and

other original documents, as of fall 2003 the Vermont Land Trust's Web site for this project recorded:

- a fall 2001 update on the processes for obtaining public input on management plans for the project's state, federal, and private lands;
- a fall 2001 corrective easement;
- a fall 2001 "agreement to clarify easement";
- a January 2002 draft long-term public access plan for the Essex Company lands; and
- a January 2002 final management plan for the state lands.

An important but still small group of policy writers has begun arguing that participants in experiments like these Champion Lands projects, as well as traditional public lands agencies, both need to focus more clearly on managing change over time:

> [There is a] critical need to fund and support evaluation of management actions on public lands. While the value of careful monitoring and evaluation . . . has been widely recognized, measures have not yet been taken to instill this type of activity on a more permanent basis. . . . Questions remain to be answered [about] how to develop accountability for [management] experiments, who will the beneficiaries of the experiments be, and what are the milestones to measure (*2002 Lubrecht Conversations,* pp. 6, 7).

> Tom Ulasewicz, former executive director of the Adirondack Park Agency, predicted that in the next thirty years the most critical problem would be trying to decide how to manage easement lands. Easement agreements are individually negotiated, and the terms are determined by the seller. Ulasewicz notes that the terms are "all over the place," making it difficult for [New York's Department of Environmental Conservation] to find a consistent way of managing them. Informing the public about the multiplicity of conditions under which the lands can be used will become chaotic. Further, it may be impossible to do some of the things included in particular easements (McMartin, 2002, p. 216).

> Easements are generally thought to be permanent [but] . . . changes in conditions and in demand for forest land are sure to occur. Land law typically provides for adjustments even in perpetual easements, but such changes may be expensive and difficult (Binkley and Hagenstein in Binkley and Hagenstein 1989, pp. 15, 17, 18).

> Most divisions of partial rights or easements are intended to divide the rights in perpetuity. Indeed, according to IRS regulations, only gifts of perpetual easements qualify for income and estate tax benefits for the donor. This . . . can produce management problems if circumstances change for either the land or its owners (Healy and Bristow in Binkley and Hagenstein 1989, pp. 142–43).

To grapple with these challenges, Daniel Kemmis has called on the Forest Service and environmental organizations to experiment with "adaptive governance" for public lands (Kemmis, *2002 Lubrecht Conversations,* p. 19). Fred Bosselman has also called on regional and state governments to invent "adaptive planning organizations" (Bosselman 2001 pp. 328 ff). Kemmis directs the Center for the Rocky Mountain West, in Montana. Bosselman teaches law at Chicago-Kent College of Law, in Chicago and in Florida (in the interest of full disclosure, Bosselman's grandfather was also a forester.) As far as I am aware, neither of their proposals cites the other. Adaptive governance and adaptive planning are simply "great minds thinking alike."

What they are *not* is management-by-contract. Instead, they are management-by-consequences: measuring, explaining, and learning from the results of both achieving and not achieving our intentions over time. Adaptive management, governance, or planning also involve adjusting intentions based on their results; if achieving a goal has unintended consequences, the adaptive response may be to modify the goal. To a lawyer, such adjustments might look like breaches of contract. Program evaluations based on a contract model would probably consider them failures. In contrast, environmental policy theorist Kai Lee calls them "double-loop learning" (Lee 1990), and believes they are critical to any long-term integration of science and public policy.

Skeptics will reasonably object to management-by-consequences on the grounds that by the time the consequences of a decision are visible, especially in forestry, the original decision makers have usually passed on (politically and sometimes physically). Yet imposing an artificially short time frame on forest management, for the sake of enforceable contracts or short-term accountability, often produces results ranging from disaster to paralysis.

From the history of forest management in Oregon's Blue Mountains, for example, Nancy Langston concludes that "Forest Service managers . . . were intelligent men dedicated to a vision, and it was this vision that failed them." As the forest's responses to management made it impossible for the Forest Service to fulfill its prior promises or contracts with Congress and mill owners (who had powerful friends in Congress), federal foresters in Oregon "closed

themselves off from the information given to them by the forest and worked in a self-referential world." Yet Langston disagrees with the idea that "if ignorance was the cause, knowledge will be the solution," arguing frankly that "ignorance was not the cause." She quotes Forest Service "silvics reports as well as working circle plans" that "show that early foresters in the Blues were immediately concerned about forest change, and indeed obsessed with ecological theory" starting in the first decades of the twentieth century. In Oregon, even exhaustive data gathering and research could not guarantee the specific results that foresters had promised Congress or local economic interests. Langston concludes that "no matter how many facts we accumulate and how many theories we test, we will never have the knowledge to manipulate natural systems without causing unanticipated changes." She calls for "changing the way we think about the land," not to predict the behavior of forests more accurately, but "to define our goals" more adaptively, necessarily "a difficult task when we know so little about the effects of our actions" (Langston 1995, pp. 189, 247, 277, 283).

Arnold Arboretum senior research scientist Peter Del Tredici tells a micro-history that perfectly illustrates the same problem. Some of the plants installed in a newly designed landscape had died. The designer, construction manager, and nursery representative stood around arguing endlessly about the cause of the problem. They could not agree on the cause, and therefore could not come up with a solution. Then the landowner stepped in, agreeing not to hold any one party finally liable for the death of the plants. With the threat of a lawsuit off the table, the various partners were suddenly able to sit down together, share relevant information, and solve the problem.

The moral of both Langston's and Del Tredici's stories is that management-by-contract systematically underuses, and may even systematically suppress, our shared capacity for both explanation and learning. When forced to choose between understanding long-term consequences with multiple causes, and parceling out short-term liability, management-by-contract always opts for the latter. Yet management that is ineffective or even disastrous in the long term seems a high price for both forests and communities to pay for the illusion of accountability in the short term.

BUILDING SADDER-BUT-WISER MANAGEMENT COMMUNITIES

Management-by-consequences needs more than tools, techniques, or even codified "best practices." Above all, it needs cross-generational institutions or communities that can stretch and grow over the full span of "forest time," that can exercise their collective capacity for acting and learning all the way from causes to consequences. Such institutions or communities must be both willing and able to:

- make and implement multiple, overlapping, long-term plans;
- face the music decades later, when each plan's least-unanticipated results finally become visible;
- learn something useful from the experience;
- then do it all over again.

Building such communities is a political and social challenge more than a legal or scientific one. It requires doing good history: using past experience to ask and answer new questions, and to complete feedback loops between causes and consequences over time. Historian William Cronon recently made this argument explicitly:

> If adaptive management depends on a more dynamic understanding not just of natural systems but of human communities, then by definition it must pay more attention to history. History, after all, is the study of dynamic systems, of change over time. It almost always reveals that things are more complicated than they seem. The way we understand the world today is rarely the way our predecessors understood it, and that will be no less true of our successors. Taking the long view can help protect us from our own time-boundedness, reminding us that goals pursued for one reason almost always have unforeseen consequences (Langston 2003, p. xii).

Conservationist Barbara McMartin made the same point when analyzing environmental conflicts in the Adirondacks:

> [In recent years staff cutbacks and early retirements have resulted in a] loss of institutional memory . . . in the Adirondack Park. . . . Because of the size of the Forest Preserve, most people only become intimately acquainted with pieces of it. Knowledge of the land is essential to planning, and the institutional memory that provided that knowledge had disappeared. Until late in 2001, natural resource managers from the deputy commissioner level to the division level have come from out of state. [It is] virtually impossible [for these managers to do their jobs] without a staff whose memory is deep. . . . [New York's Department of Environmental Conservation] has taken on many new initiatives that are then abandoned by new leadership with new agendas. . . . Many good programs have just

been trashed or swept under the carpet, never to appear again. DEC's failure to build on the past is one more example of its lack of institutional memory (McMartin 2001, pp. 212–13).

Most institutions practice history as self-justification, celebrating their successes and conveniently forgetting their failures. The best candidates for adaptive management are not these self-congratulatory communities. Rather, they are the sadder-but-wiser ones, organizations strong enough to acknowledge that short-term happiness can result in long-term sadness, and vice versa; and to reinterpret the same past events as new consequences surface over time. On those grounds, it may actually be hard to find a better candidate for adaptive management than the U.S. Forest Service. The Forest Service's primary qualification as a candidate for management-by-consequences is precisely *not* its technical expertise, but its actual history, and the place of history as an activity or an attitude in the culture of forestry as a profession.

In his study, *The Forest Ranger,* Herbert Kaufman noted that:

> Under the most favorable conditions, it takes 20 to 25 years for a tree to reach pulpwood size . . . and it generally takes three to five times as long to bring a saw timber species to maturity. Similarly, it takes decades of careful management to bring an abused range back to a healthy state. Small wonder, then, that foresters develop the habit of "thinking in terms of decades and centuries, rather than of days and years, working on with persistence patience. . . . Often the laymen cannot sympathize with the forester here, or cannot comprehend this mental approach. Yet with us it is a sine qua non. . . . Every time a forester or timberland owner plants a tree, conducts a logging operation, or prepares a management plan he is influencing the course of events for the next 10, 50, or 100 years" (Kaufman 1960, pp. 224–25; quoting W. Mulford, Duke University School of Forestry Lecture, May 1941).

Most foresters were once explicitly trained to think this way: in multiple-generation, not just multiple-use or multiple-interest, teams. Whether they are still trained that way is not clear, but thinking in forest time is still very much a part of forestry's professional culture and heritage.

The Forest Service has long staked its claims to land management authority primarily on what historian Samuel Hays has called the Progressive "gospel of efficiency": "scientific forestry [as part of] large-scale, long-term planning and management in both private and public affairs" (Hays 1959, pp. 34–35). Many critics have shown how pride in its own expertise has in the past led the Service to ignore new information and rebuff new values (Frome 1984, Clary 1986, Hirt 1994, Langston 1995).

Yet the U.S. Forest Service is now, at least temporarily, sadder-but-wiser than it was during many of the episodes studied by these historians. Even the loyal opposition is worried about staff morale (*2002 Lubrecht Conversations*, p. 9). As Nancy Langston notes,

> The early Forest Service workers told a story that was full of promise and exuberance, and this story betrayed them. They saw their work as a heroic struggle. . . . It is a sad thing for foresters to give up that story and end up instead with pale green government offices and broken Xerox machines, endless meetings and petitions, and angry people grumbling at them all the time. (Langston, 1995, p. 300)

Breaking an agency's spirit is surely not the best first step toward adaptive management; *but neither is restoring that spirit*. Like most organizations, the Forest Service has often rushed in to erase the evidence of past error (Langston 1995). Many in the agency, and many of its friends, are now anxious to boil the conflicts of the last two decades down to a list of timeless lessons and best practices for the future. Yet this simplification would turn messy, complex experiences into simple "do vs. don't" rules; time back into space; and consequences back into contracts. For the Forest Service and other land managers, keeping the wisdom but losing the sadness would be just as much of an error as throwing the baby of forest time out with the bathwater of destructive forest practices.

Management-by-consequences demands, not soothing consensus, but a live, energy-generating tension between:

- the capacity to develop and share wisdom: esprit de corps (what Forest Service employees and retirees have often called the "feeling of family" within the agency) and
- sources of sadness: conflict, criticism, and error

MANAGING CHANGE IN FORESTS AND COMMUNITIES: SOME INSTRUCTIVE EXPERIENCES

Over the years, critics of the Forest Service have consistently focused on its timber management. Yet the service has often focused considerable attention on creating and supporting forest management communities, within the agency itself and in partnership with local communities. As

the Forest Service and other public agencies look to partnerships and public participation as management tools, its past experience is a critical, systematically under-used resource. That resource includes both ideals of community or ecosystem stability, and stories about how and why those ideals have (or more often have not) been realized.

Changing Organizations: Building a Management Community Inside the Forest Service

Three books written about the Forest Service, in drastically different eras and for drastically different purposes, together illustrate the feedback loop that adaptive management requires establishing between wisdom and sadness. Herbert Kaufman's study of *The Forest Ranger*, published in 1960, is as close to a love poem as the Forest Service has ever received from outside its own ranks. Paul Hirt's *A Conspiracy of Optimism: Management of the National Forests Since World War Two,* and Nancy Langston's *Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West,* published in 1994 and 1995 respectively, are anything but. Yet the admissions of error and the internal revolution of the early 1990s documented by Langston and Hirt could not have happened except in an agency with the strong sense of identity and institutional memory documented by Kaufman.

Kaufman attributes the agency's unity, not to strong central controls, but to its delegation of authority and tradition of profound respect for the work done literally in the field, by district rangers and their staffs. His field visits and interviews firmly convinced Kaufman that by the 1950s, the purpose of the Washington Office (WO) was primarily to support the field staff. He reports that:

> In an earlier day, [to create the national budget] the regional foresters assembled like ambassadors at international conferences. Indeed, . . . [in 1930] they actually drew up a "Treaty of Washington" that hung for many years in the office of the Assistant Chief for Operation:
>
> Whereas the race in competitive armaments, in National Forest finance, no less than in wider fields, must in the end make liars out of honest men, and
>
> Whereas the exercise of undue and unrestrained imagination in picturing estimated cost to complete, and necessary cost for adequate, must lead to constant bickering among ourselves and with our chief [sic], and
>
> Whereas no intolerable burden should be placed on our imaginations and our bosses' blue pencil, and
>
> Whereas with external enemies hounding our flanks and our rear, we must either hang together or hang separately,
>
> Now therefore, to the end that these evils may be avoided and that we may live at peace with one another,
>
> We, the undersigned, as lords of our several domains do hereby covenant and agree with each other and all with our Chief,
>
> That hereafter international peace shall be held more precious than allotments, and parity more dear than reactions.
>
> Done in the City of Washington this 5th day of April, 1930, A.D. (Kaufman 1960, p. 121).

Kaufman also quotes a 1955 letter, widely circulated within the Forest Service, from the Chief to an assistant secretary of agriculture about the regular field inspections conducted by the Service:

> When I say "inspection" I do not mean "investigation." An "investigation" implies searching for something that's dishonest or otherwise wrong. . . . I am talking about something quite different. . . . We always try to recognize good work as well as to point out needed improvement. . . . The attitude is to see how together we can do a better job. I explain this partly because many people do not understand why we customarily state in inspection reports that something "should" be done rather than say it "shall" be done. I suppose that with us, should means shall, but we try to avoid the master-and-slave attitude that tends to weaken individual initiative and a sense of joint responsibility (quoted in Kaufman 1960, pp. 142–43, 188).

Kaufman seems to believe that this euphemism really worked, that Forest Service employees felt what 1990s management theorists would call "empowered." Such theories are more honored in the breach than in the observance by most American businesses, let alone by public agencies and nonprofit organizations. But in Kaufman's description, the federal forest ranger sounds very much like the corporate manager quoted by Donald Schön as the quintessentially reflective practitioner: "Once you have identified the conflicts, your [job is to] see to it that [employees] resolve them and that they let you know the results. If they agree ahead of time, too quickly, that can shield you from legitimate conflict. It breaks your heart when you see people have stopped talking about it" (Schön 1983, pp. 250 ff).

The federal foresters whom Kaufman interviewed seldom "stopped talking about it" or "agreed too quickly":

> Men in the field, rather than fearing inspection, tend to

welcome the opportunities it affords them to keep abreast of developments in the organization, to learn the latest rumors and gossip, and to give their own ideas to their superiors at first hand. The fact remains, however, that the written reports following every inspection are blunt and hard-hitting. . . . They pound their points home. . . .

[Yet the WO regularly requests feedback from field offices, and even conducts] massive surveys … not every day, but … frequently enough, and … supplemented by similar inquiries from regional offices, to betoken to field men that they are not simply passive instruments manipulated by the agency leaders. . . .

Few men who are under inspection pass up the chance to ventilate their suggestions and criticisms … this practice is not only tolerated, but encouraged, and members of the Service insist that their recommendations and complaints do get back to the higher levels, sometimes generate action, and do not (unless carried to an extreme) result in injury to the sources for being outspoken . . .

. . . the Rangers are told over and over again that they are the pillars on which the Forest Service rests (Kaufman 1960, pp. 145, 149, 186ff., 190).

In short, Herbert Kaufman's Forest Service sounds too good to be true. And many histories of the Forest Service and the national forests have come to exactly that conclusion. Paul Hirt and Nancy Langston have meticulously dissected what Hirt calls the "conspiracy of optimism" that led the service, in collaboration with many members of Congress and most U.S. presidents, systematically to overestimate the amount of timber that could be harvested from the national forests in the decades after World War II.

These two recent histories also illustrate dramatically how collisions between short-term political expedience and the institutional values described by Kaufman can vaporize institutional memory, and fatally undermine management-by-consequences. Langston blames "the scientific optimism behind American forestry — the faith that whatever exists can be understood" for what William Cronon characterizes as "ecological disaster" in the Blue Mountains of Oregon (Langston 1995, pp. viii, 296–97). Langston painstakingly shows how, in many early twentieth-century "silvics reports" for this region's national forests, "foresters would first admit that there were too many contradictory uncertainties to be sure of anything, and then two pages later they would reaffirm existing policy — thus suppressing doubts, uncertainties, and internal debates. . . . Failures of fire and insect control generally led not to a reevaluation of the enterprise but to . . . more intensive management to fix the problems management created" (pp. 196–97). Similarly, Hirt notes that a 1992 report by the congressional Office of Technology Assessment on "the strengths and weaknesses of the forest planning process" concluded that the Forest Service was over-emphasizing timber at the expense of other forest values; that "the [long-term] monitoring and evaluation of forest management activities had been inadequate," that politically-motivated budget decisions often overwhelmed planning decisions; and that national targets for levels of timber harvesting "often nullified local management decisions." Hirt comments that "these conclusions would have been valid had they been written at any time since World War II" (Hirt 1994, pp. 270–71). In the 1990s, the Forest Service began promoting environmentally sensitive "New Perspectives" as official policy. Yet Langston and Hirt both document that timber targets still continued to rise, in response to pressure from particular members of Congress.

At the same time, however, regional and district foresters still apparently continued to draw up plans that ran head-on into these national budgets and policies. In 1989, Forest Service employees openly organized the dissident Association of Forest Service Employees for Environmental Ethics (Hirt 1994, pp. xli and 281). In the 1990s, "many forest supervisors admitted that their national forests were overcut in previous decades or that resource rehabilitation efforts had been unsuccessful or inadequate" (p. 274). Langston characterizes the Forest Service's own 1991 *Blue Mountains Forest Health Report* as "an unusual admission of guilt and confusion," which argued "that the forest health crisis had been caused by [the agency's] own history of forest management" (Langston 1995, p. 265). Individual forest supervisors resisted the targets and even talked to the press about their resistance. One (Northern Regional Forester John Mumma) was threatened with transfer to the dreaded WO, and resigned in protest. Forest supervisors who had worked under him protested, as did the environmental newspaper *High Country News*. The head of the Forest Service's own whistleblower program retired, then blasted the service in a January 1992 *New York Times* op-ed piece called "Can't See the Forest for the Sleaze" (Hirt 1994, pp. 286-87). Hirt cites polls showing that the level of support for increased timber harvesting on the national forests, *among Forest Service employees*, dropped from 62 percent to 7 percent in just the three years from 1989 to 1992 (pp. 281ff.).

In 1993, Jack Ward Thomas became the first non-forester to serve as Chief of the Forest Service (Thomas was a wildlife biologist by training; Hirt 1994, p. 291). Hirt's analysis of the Clinton/Gore "win-win" solutions to conflicts between timber production and wildlife or forest aesthetics, pursued on Thomas's watch, is almost as acidic as his analysis of the conflicts themselves.

Did some Forest Service employees suffer "injuries for being outspoken"? Definitely. Did many employees silently accept a new "master-and-slave attitude" emanating from the WO? Perhaps.

Yet many of the actions, reports, and opinion polls cited by Langston and Hirt also reveal that there were significant tensions *within* the agency. The opinion polls were usually conducted by outside academic organizations, but they surely required permission from the service itself. In that sense, they served the same purpose as the earlier, "massive" internal surveys reported by Kaufman. If the WO really did not want to know, or want the public to know, whether its field officers held opinions different from those being promoted in Washington, it could have denied permission for such surveys. During this period, Forest Service employees who were critical of the agency' s official positions did not simply jump ship. To a remarkable degree, they acted as though they were still "the pillars on which the Forest Service rests." They surely recognized the career risks that came with criticizing their agency from within, but they did not assume that there was no point in campaigning for change from the inside out. The appointment of Thomas as Chief was in some sense a response to external critics, but it was also a response to internal debate. It happened within the service's still-unbroken tradition of promotion from within, which as Kaufman had documented, was intended to keep top agency positions out of the political spoils system.

In short, the 1990s Forest Service still sustained some sense of community or family. But that family was not the Brady Bunch. It was more like the internally contested, place-based community that Dan Kemmis describes as including both his mother Lilly and his neighbor Albert Volbrecht, in *Community and the Politics of Place:*

> In another time and place, Albert and Lilly would have had nothing to do with one another [and] our barn might not have been built. . . . Lilly and Albert didn't like each other much better at the end of the barnraising than at the beginning. But that day, and many others like it, taught them something important. They learned, whether they liked it or not, a certain tolerance for another slant on the world. . . . to accept one another[, and they learned] that they could count on one another. . . . And because Albert and Lilly and the rest of our neighbors were able to count on one another, they experienced the satisfaction of accomplishing a big, tough job by working together (Kemmis 1990, p. 71).

As they try to build their own capacity for management-by-consequences, conservation organizations and public agencies alike should remember and tell this story of what Langston has sometimes called "constructive conflict" (personal communication) within the Forest Service. Adaptive management requires both organizational wisdom — Kemmis's "learning to count on one another," or the sense of institutional loyalty and memory described in Herbert Kauman's *The Forest Ranger* — and organizational sadness, — Kemmis's "not necessarily liking one another," or the tradition of internal dissent documented in Paul Hirt's *Conspiracy of Optimism,* and Nancy Langston's *Forest Dreams, Forest Nightmares.*

Changing Economies: Working Circles, Sustained Yield, and Local Communities

Over much of its institutional life, the U.S. Forest Service has tried to prevent the capture of national forest resources and staff by local interests. Forest Service staff, friends, and critics have all interpreted this as the primary goal of the service's systematic policy of transferring staff frequently, particularly in the early years of their careers. Many accounts have focused on the transfer policy's disadvantages for community relations and local knowledge:

> The complaint was heard [locally] that . . . whenever a ranger showed ability, he was promoted and transferred (Steen 1977, p. 170).

> When a particular Forest Service employee does get involved in the community or in some promising consensus-building work, [he or she is] often moved to a new position in a different forest in a few years, leaving in limbo the work [she or he has] begun (*2002 Lubrecht Conversations,* p. 8).

In response to such criticism, much recent writing has turned this old concern about capture inside out, by arguing for the need to foster a local sense of "ownership" in public lands. Many theorists have begun to argue that national forests should be managed at least partly as local "commons" (Geores 1996; Kemmis 2001; Bolgiano 1999; Shannon 1998).

Martha Geores describes the earliest period of Forest Service administration on the Black Hills National Forest of South Dakota as just such a local common property system. From 1905 to 1919, she argues, Gifford Pinchot used the Black Hills "as his model forest where he tried out new ideas before recommending them for use in other forests. One of his biggest contributions was to essentially foster a forest community and treat the [forest] as a common property resource. He insisted on having local people working for the Forest Service and called on all who lived within the

Forest bounds to become managers of the forest" (Geores 1996, p. 26).

Pinchot advised his first generation of rangers to let local populations use unlimited quantities of wood and other products from the national forests for strictly domestic purposes (Geores 1996, p. 66). The 1905 and 1907 editions of the Forest Service's *The Use Book* noted that no one would face rigid quotas in trying to buy national forest timber, but that "monopoly to the disadvantage of other deserving applicants will not be tolerated," and that "there is no chance for monopoly [when] the local demand is always considered first" (Clary 1986, p. 23). According to Clary, "the agency went out of its way to emphasize the long term and its orientation toward local communities" (p. 77). Pinchot also decreed that receipts from the national forests should be deposited with regional banks.

As Martha Geores and Charles Miller note, however, these policies were in the agency's self-interest. The federal government needed a "forest community" on the ground because it "did not have enough funds to take care of the forest without the cooperation and involvement of the local population" (Geores 1996, p. 59). And one of the early rangers' most critical charges from Pinchot was to "develop local acceptance" of the national forests (Miller 2001, pp. 157–58).

Inevitably, relations between the national forests and local communities became more complicated, as the communities began to need the Forest Service more than vice versa. Rangers on the Black Hills National Forest noticed that "apparently some of the homesteaders were speculating in timber and selling all that they could cut from their homesteads." The service tried to preserve subsistence rights by curbing speculation: homesteaders could cut timber for their own use, but "could not denude the plot to sell it as agricultural land or speculate on land before title passed. They could not cut timber for sale, no matter how the money was to be used. If the settlement claim was abandoned after timber was cut, there was a presumption that the primary purpose of the claim was for timber" (Geores 1996, p. 72). These subtle and complex regulations foreshadow the challenge the Forest Service (and environmental nonprofits) would face in the coming decades, in attempting to support local communities and forests simultaneously.

As early as 1908, the service began to make stability an explicit aim of management, at least for the forests themselves, by mapping out "working circles" on the national forests. These were areas large enough so that, by the time the last section had been cut, the trees on the first section cut would again be large enough for harvest (Clary 1986, p. 43). The goal of working circles was to stabilize the forest, not at a parcel level, but on what modern planners would call a "landscape scale" (bioregionalists may be interested to know that one federal forester in this period proposed watersheds as the basic planning unit).

In 1918 and 1919, the service commissioned reports on what David Clary calls "the social history of traditional lumbering" and working conditions in forest industries (Clary 1986, p. 22). It found, predictably, that the moving lumber frontier was associated with ghost towns and "exactly the kind of rootless, migratory underclass that Progressives regarded both as a national disgrace and as a potential menace to public order" (Clary 1986, p. 23). To be honest, these reports were probably commissioned to provide an excuse for the service to begin experiments it had already wanted to conduct, in creating what Clary calls "stable communities around the national forests."

The first experment was the 1923 management plan for the Coconino National Forest in Arizona, which divided "the forest . . . among several identified local lumber businesses, with a share being marked out for each," aiming among other things to "stabilize and maintain the lumber industry on the Forest and the industries dependent on it" (Clary 1986, p. 73). Not surprisingly, those businesses took this new policy as an implicit, long-term contract for raw materials, and promptly expanded (Clary 1986, p. 73). By 1927, however, the Coconino's forester wanted to shift to "improvement cutting focused on future growth." He decided "to quietly drop the territorial system and to let the marketplace work its way, even if it were to bankrupt one of the firms."

Clary thinks this experiment should have taught the Forest Service:

> the dangers of placing too much emphasis on economic benefits to local industries so as to justify the existence of the national forests. Once an industry became dependent upon a national forest, its vested interest could be seriously impaired (and people could be thrown out of work) if the forest's management program changed to correct previous errors or to account for newly recognized resource values, especially those that were not so easily measured in terms of jobs and tax receipts (Clary 1986, pp. 78–79).

If this lesson was learned in the 1920s, however, it was apparently forgotten thoroughly enough so that the service had to learn it again the hard way from the 1940s through the 1970s. In 1944, Congress passed the Sustained-Yield Forest Management Act, authorizing the Forest Service to set up "sustained-yield units." "Federal units," based entirely on land inside the national forests, "would reserve national-forest timber in given areas for the exclusive use of local operators." "Cooperative units" relied on both public and private land, and would in effect "merge the manage-

ment of national-forest and private timberlands." In Clary's account, "the objective of both was community stability, but at the price of monopoly for the favored companies." The Forest Service recognized this price at the time, but decided it was worth paying (Clary 1987, p. 126). Undoubtedly, the national economic planning involved in both Depression-era relief and war production both played a part in overcoming the aversion to monopoly that the service had inherited along with Pinchot's *The Use Book*.

Attitudes toward these sustained-yield units were always mixed within the Forest Service, and in the end only five were created on federal lands, and only one cooperative unit was created — all in the West. Environmental policymakers may see these experiments as precursors of ideas such as "sustainable development." But perhaps they should see them instead as warning buoys.

In his mildest conclusions, Clary sees all six units as "a perpetual source of frustration and complaint" (Clary 1986, p. 131). Hirt just calls them "dismal failures," and notes that "the community stability version of sustained yield policy . . . became popular with the timber industry and with congressmen from states with national forests as a way to promote more logging on the public lands" (Hirt 1994, p. 41). By 1977, Shands and Healy describe how "changing economic conditions and new environmental demands" had "put strains on the relationship" between the government and the company in the only cooperative unit ever established, in Shelton, Washington: "The Forest Service has come under pressure to withdraw land from timber production for environmental reasons; the company chafes under federal restrictions that prevent it from selling logs from company lands within the management unit to Japan, where they would bring much higher prices. . . . The agreement illustrates some of the potential problems with very long-term agreements between parties whose economic or political objectives may be subject to change" (Shands and Healy 1977, pp. 137ff.). Though this unique 100-year contract lasted longer than any of the others, it was finally terminated in 2002.

Among the six units, the saddest (and potentially wisest) story may be the one that Clary tells for Vallecitos, New Mexico. The unit was designed to support a sawmill and box factory that, it was hoped, would "raise the economic well-being" of the area's "small farm-stock owners." From his never-sentimental perspective, Clary says it was really designed "to provide compensating employment income to subsistence-level graziers whose federal grazing allotments were about to be reduced" (Clary 1986, p. 132). To achieve that purpose, and to counterbalance the monopoly advantage of a long-term contract for national forest timber, the mill owner was required to recruit his workers from within a fairly narrow radius around the mill. The company insisted it could not find enough (motivated, reliable, skilled . . .) workers within that radius, and frequently recruited outside it. Clary notes that the boundary actually cut through the middle of Ojo Caliente, where many mill employees lived. Unfortunately for the residents of Ojo Caliente, it "was an old colonial land grant that took modern form as a succession of small holdings that extended ten miles down a valley." Clary comments dryly that "to the Anglo foresters [in charge of the planning,] that was not a community; it was a rural area" (Clary 1986, p. 134ff.).

Yet the project's thorniest problem was not the perception gap between Anglo foresters and local settlement patterns. It was rivalries among and within local communities. The Forest Service tried resolving the conflict democratically. In a poll, the residents of the six small villages within the original employment radius demanded that people from outside that radius be excluded from mill jobs. The Forest Service then held a public hearing that "became so hostile that [the] company did not make a presentation" but sent in its deposition separately. Pulling out one last tool of public participation, in 1957 the Forest Service appointed an advisory board "to offer recommendations on labor questions." The service presented the resulting agreement to the company, which refused to sign it; the Service sent a delegation to insist, the company again refused; and that night, *the mill burned down*. The Forest Service then awarded the company's revoked contract to another company; in 1963, *that company's mill burned down*. The local communities objected to Forest Service plans to close the unit, but also to letting a mill farther away use the timber from it, even to salvage lumber after a major forest fire. With an impressively straight face, Clary writes that "the answer was to bring the two sides together." A meeting with workers and a new company produced a new contract in 1972; and in 1977, *that mill burned down*. Clary finally lets down his scholarly guard and admits that "from every standpoint the Vallecitos Unit was a dismal failure. By the time the Forest Service had acknowledged the mistake [of creating the unit in the first place], it could not be corrected; local people simply would not go along with termination, for whatever reason" (Clary 1986, pp. 134ff.).

The mistake was as much social as economic. Trying to fend off charges of harming local communities as it withdrew grazing leases for what may have been good land-management reasons, the Forest Service may have had a "need not to know" that those communities were fractured internally. As in many human communities, when push comes to shove, the people of Vallecitos and Ojo Caliente did not always speak with a single voice, sometimes even when it might have been in their own interest to do so.

It is important to remember that such internal fragmentation is not necessarily a problem to be solved. Just as

subsistence and speculation were tangled together in homesteaders' uses of Black Hills National Forest resources in 1908, genuine aspirations and political maneuvering were probably tangled together in Vallecitos, and are probably tangled together now in what many local communities, private businesses, nonprofit organizations, and public agencies all say about community stability and forest management. Along with the sawmill owners, the residents of Vallecitos and Ojo Caliente probably staked resource claims in the name of community stability, while keeping the option of mobility (for both people and capital) under the mattress, just in case.

This double-sidedness is far from a recent development in American history. Historian Samuel Hays points out that "resource exploitation" has long "reflected the attitude not merely of corporations, but of Americans in all walks of life. Small farmers, as well as corporate leaders, helped to establish a wasteful pattern of land use. Everyone in the nineteenth century hoped to make a killing from rising land values and from quickly extracting the cheap, virgin resources of the nation" (Hays 1959, p. 263). Hays points out that it is tempting but wrong to romanticize farmers and loggers. Many northern New Englanders were never on the land for the long haul, but intended to cash out after the first crop — or decided they had no choice but to cash out (during the recurrent economic downturns and financial panics of the 1870s, 1880s, and 1890s, for example). The same has been true for large landowners, whether in the 1890s or the 1990s. In contrast to nostalgic twentieth-century assumptions, nineteenth-century rural Americans — especially those who owned little or no land — were anything but rooted in place. Rural people in the nineteenth century moved almost as often as twentieth-century suburban Americans (Parkerson 1995).

Historian Nancy Langston has pointed out that these American circumstances complicated the efforts of Progressive American foresters to transfer European forestry across the Atlantic. She argues "European scorn made [Gifford] Pinchot and his followers determined to prove that American forestry was possible, but they did this not by transforming ideals of European silviculture to fit American forests, but by transforming American forests to fit European ideals" (Langston in Miller 1997, pp. 259, 261). Langston focuses on logging old growth as a tool of this transformation. But attempts to stabilize both forests and communities may have been (and still be) another.

American foresters, and American conservationists in general, have often been willing to trade away the option of social mobility to achieve demographically and ecologically stable communities (Stoll 2002 on George Perkins Marsh, p. 71). Clary and other writers see the Forest Service's experimental sustained-yield units as thinly-disguised monopolies or subsidies, whether for places or for companies.

Yet if true, this interpretation simply means that these experiments in community stabilization reflected rather than departed from the principles laid down by classical, Progressive conservation. Despite the Progressives' proclaimed dislike of monopoly power, Hays argues that "it [eventually] became clear that larger corporations could more readily afford to undertake conservation practices, that they alone could provide the efficiency, stability of operations, and long-range planning inherent in the conservation idea." Despite their differences, government and corporate planners agreed on the need to "abolish the uncertainties and waste of competitive resource use" (Hays 1959, pp. 263, 266). In short, they agreed on a strategy of stabilization.

The turn-of-the-nineteenth-century campaign for public ownership of eastern forests also illustrated this same ends-justifies-the-means approach. Richard Judd reports that:

> After 1880, [the] small-business economy [of rural northern New England] was eclipsed by large pulp and paper producers. By 1900 the commercial forest was divided almost evenly between farmers, resort proprietors, and owners of small mills on the one hand, and large companies on the other. . . .
>
> A wave of land speculation at the end of the century crystallized these apprehensions [about forest destruction] into a conservation movement.
>
> The most notorious example was the New Hampshire Land Company, a Hartford- and Boston-based firm that by 1880 had acquired about 240,000 acres of mountain timberland in northern New Hampshire. The company indicated in its prospectus that it . . . proposed to convert forests to cash on terms that could not have been more unsettling to local forest users (Judd 1997, pp. 100, 103–104).

Interestingly, advocates of public ownership made two contradictory predictions simultaneously about the future behavior of the New Hampshire Land Company, that it would:

1. hoard the forest, excluding farmer-loggers and either withholding trees or pricing them beyond the reach of small sawmills until most went bankrupt; and
2. clearcut the forest, causing erosion and floods that would damage the interests of two larger-scale enterprises: vacation resorts and the textile and other mills that owned downstream dams vulnerable to both erratic streamflow and siltation.

In this case, farmers and small sawmills may have been

the "poster children" for the campaign against land consolidation. But the ultimate outcome was probably determined by the struggle between two sets of large-scale enterprises: pulpwood vs. the combined might of tourism and textiles. Hays might not even consider it ironic that conservation campaigns a century later seemed to have changed sides, seeing the fragmentation of forest ownership as a problem, and subsidizing or buying out (through easements) some large-scale ownerships first consolidated during the heyday of the New Hampshire Land Company.

In short, the conservation movement may often have put the rhetoric of democracy and populism on the table, while practicing monopoly and centralization under it. But even if that is true, it only means that each side in the partnership between national conservation and local communities has itself been double-sided, saying one thing and doing another. Neither has earned the right to throw ethical stones at the other.

In the light of this history, conservation organizations might rethink "stability" as a management goal by taking a page from another kind of land-use history, one with which relatively few of them are familiar: urban revitalization and community development (Ingerson 1999). Community organizations and local governments in cities have learned the hard way, through experience since the 1950s, to beware of arguments for "stabilizing" things, whether those things are jobs or places. These arguments are often sincere, but just as often (and sometimes simultaneously), they are also attempts to shift long-term risks or costs onto the public sector, while creating or retaining short-term benefits privately. The "private party" involved is not always a corporation; sometimes it is a resource user group, or a neighborhood. Either way, the results are often like the story of the Shelton and Vallecitos sustained-yield units. Communities and companies, like ecosystems, are not inherently stable — but they are not random-event generators either. The challenge shared by forests, sawmills, and urban as well as rural communities is not achieving stability, but directing, anticipating, and adapting to change.

The Forest Service and Congress seem to have learned this principle repeatedly, throughout the twentieth century. But they have also repeatedly forgotten these experiences. As a result, by the time "adaptive management" came into widespread use as a term in the 1980s and 1990s, it sounded (once again) like a new discovery. Making a practice of studying national forest history might well save new public-private partnerships the pain of having to re-learn the same principle yet again, from direct experience, in the twenty-first century (Dabson, et al. 2001).

Managing change requires building channels of communication, not only between public land managers and local communities at a single moment in time, but among and between managers and communities over time. From this perspective, the longstanding ambivalence of Forest Service staff about the frequent-transfer policy looks less like institutional self-justification, and more like an indirect way of expressing the hope of balancing two important ways of organizing and transmitting knowledge: through institutions, and in places. Herbert Kaufman reported the depth of this ambivalence within the agency in 1960:

> During each man's early years, he never has time to sink roots in the communities in which he sojourns so briefly. . . . He barely becomes familiar with an area before he is moved again. Only one thing gives any continuity, any structure, to his otherwise fluid world: the Forest Service. . . . One forest supervisor reported he thought he might have been brought up on charges of insubordination if he refused to move. Actually, this seems most unlikely, but this expression of concern by a high-ranking officer suggests how much importance is attached to transfer. . . .
>
> [But] transfer policies . . . arouse concern among those who prefer field officers who are not estranged from the communities in which they work, who do feel sympathy for their neighbors, who have a deep and full understanding of local needs and problems (Kaufman 1960, pp. 177–78, pp. 237–38).

Thirty years later, a poignant section called "Moving," in a remarkable in-house history of the eastern national forests (Conrad 1997), lamented the same ambivalence:

> The dedication of Forest Service people can be seen in their willingness to transfer. . . . It is traditional in the service that employees, especially those on their way up the career ladder, must move to a different post every few years. It is not uncommon for a person to work 35 years for the Forest Service and stay only 2–4 years at each of a dozen different places.
>
> When asked about the problems of moving, Forest Service people are stoical. They say that transfers are part of being in the Forest Service. You cannot get too deeply rooted in one place — your home is the Forest Service. . . . The feeling of family which pervaded the Forest Service . . . helped to ease the loneliness of dislocations.
>
> The modern-day leaders of the Forest Service have not changed the system of frequent transfers. Perhaps it is because they went through it themselves. . . . [It also] prevents field personnel from putting down deep roots and becoming so attached to a locality, or a forest, that they lose their perspective or their primary loyalty to the service and its mission. [It also gives]

broad training . . . [to] upward bound people. . . .

The tradition of frequent moving tends to divide Forest Service people into two groups — those willing to move and those not willing. . . . [The first group was mostly] the professional, college-trained, and upward-bound people. . . . [The second group was] usually local people with no college training and no desire to leave their home town (Conrad 1997, pp. 270–71).

Management-by-consequences may require learning to approach these tensions, as well as the shifting or conflicting interests within local communities, less as problems to solve than as realities to understand. As a tool for both analysis and communication, history can help organizations and communities meet that requirement.

Changing Processes: Collaborative Planning for Forests & Communities

Many policy analysts have argued that land-use planning, even for single ownerships, is always about shared authority. Decisions made about one parcel of land inevitably affect the value and use of neighboring or competing parcels. A 1977 set of recommendations for national forest planning, for example, recommended that federal plans should:

> describe the interrelationship of public and private land and should assess the potential of nearby private land to meet public needs, a critical variable in determining the best use of the public's forest land. . . . Forest plans should analyze the condition of the local and regional environment and the present and future role of the forest in regional environmental enhancement. Finally, forest plans should evaluate the effectiveness of the state, regional, and local governments and agencies which control private land and resource use. . . . If a local jurisdiction has no zoning ordinance and ineffective subdivision controls, the forest plan should say so — and explain what this means to the public's land. . . . Additionally, forest plans should explain how forest management fits into — and, ideally, reinforces — regional planning efforts (Shands and Healy 1977, pp. 135–36).

It is not hard to imagine how local and state agencies, let alone private landowners in and around the national forests, would have reacted if the Forest Service had implemented these recommendations from the top down. It is one thing for the federal government to bribe state and local governments into compliance with its plans through grants or incentives. It is quite another for the federal government to pronounce from above on the "productive potential" of private lands, or the "effectiveness" of state and local governments.

In all fairness, and knowing one author of this 1977 report, I think he would phrase these recommendations very differently if proposing them in 2004. Yet in a bottom-up sort of way, many of these 1977 recommendations actually *were* implemented. Since the late 1960s and mid-1970s, even the national forests that Carl Reidel has called "citadels" — those owned in fee simple by the federal government — have had to run an almost continuous gauntlet of requirements for long-term planning and public participation (Reidel in Klyza, 1994). The gauntlet consists of the National Environmental Protection Act (NEPA, 1969), the Forest and Rangeland Renewable Resources Planning Act (RPA, 1974), and National Forest Management Act (NFMA, 1976), among other legislation and executive orders.

Some in the Forest Service have welcomed this new emphasis on comprehensive, multiple-use planning:

> While [the title of a 1984 Forest Service report] *Working Together For Multiple Use* . . . may have sounded like a standard pep talk to outsiders, to perceptive people in the Eastern Region it had a deeper meaning. Management was saying that the days of forester rule were over. Now wildlife, recreation, wilderness, environmental protection, scenic quality, human resources, public interest, and many other factors would take their place along with forestry in forest management. The booklet was probably received with silent rejoicing in many "shops" throughout the region, other than the timber management professionals (Conrad 1997, p. 254).

Other interested parties also invested high hopes in planning. Some critics hoped to make the Forest Service more accountable to the public, directly and through congressional oversight. Others hoped for almost the reverse: to prevent the president and Congress from using the budget process to sabotage changes that the Forest Service itself supported, as had happened frequently before (Frome 1984, Sample 1990). Hirt points out that the RPA required the Forest Service to submit not only its management plans for congressional approval, but also an "annual report comparing agency accomplishments with the [approved] objectives"; and it required the president to submit a policy statement about how planning goals would be achieved, along with "an explanation for any budget request that failed to provide the funds necessary to achieve the goals of the policy statement" (Hirt 1994, p. 259). In other words, Congress knew that the only way to tell whether approved polices had actually been implemented, or had instead

sunk silently beneath the political waves, was to treat the budget itself as an evaluation tool.

Yet many writers, both inside and outside the federal government, agree with historian Hirt that in practice most of these high "hopes went unrealized":

> The original legislation [NFMA] set up a committee of scientists to develop the regulations governing forest planning. There were 2,200 lines of directions in those regulations. . . . The planning process preoccupied District and Forest personnel for 6 years, requiring much of their time and taking them away from other work. The forest plans project management practices from 40 to 150 years into the future . . . [but must] be revised every 10 to 15 years. When such reviews take place, the whole process will be repeated, including determining public sentiment and incorporating all new information to determine the best management direction (Conrad 1997, pp. 256, 259).

> RPA was an answer to a bureaucrat's prayer. It superficially realized longstanding visions in the Forest Service of a comprehensive national forestry plan based on a comprehensive inventory, with the service producing both according to its own judgment. More practically, RPA authorized the endless generation of paperwork . . . The service now assembled, in the name of multiple use, impossibly expensive plans to manage everything (Clary 1985, p. 189).

> The first round of national forest planning under RPA cost over half a billion dollars, and produced over a quarter-million pages of pages of paper occupying over sixty feet of shelf space. [These plans have] diverted the energies of thousands of professional resource managers and citizens for the more than ten years [the plans] have been under development. Whether this staggering investment results in better management of our national forests or produces little more than a very large and very expensive stack of paper will be determined by the willingness of the Forest Service, and the Congress, to innovate (Sample 1990, p. 228).

> NFMA . . . may have overstated the expectations of the Forest Service for the involvement of local people in management, but there was movement . . . [Yet] there is [still] not any agreement by all users to also be managers. Recreational users. . . . require great amounts of management and service, but take no responsibility for sharing the cost. . . . Wilderness areas . . . ended up in litigation (Geores 1996, p. 27).

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Already by 1981, University of Arizona forestry professor Richard Behan thought it was time to repeal both RPA and NFMA. He called an industry challenge to the first NFMA plan filed (for the Lolo National Forest):

> professional, massive, and immediate. Is this the first example of an imperfect plan, and therefore an illegal one? If so, there is just one response for [the forest supervisor] to make: He has to redouble his effort, hire more planners, expand the interdisciplinary team, refine his data with a more comprehensive and sensitive inventory, consider more alternatives, and run FORPLAN until he chokes the computer. And he will have to document every step to be ready for litigation later. . . .
>
> I believe a new pattern of public forestry is in order, in which the forest manager sees his task as actively solving public problems, not passively executing public laws. It will call for initiative, courage, imagination, and the fashioning of unique and independent decisions to fit unique and independent situations, often through mediation and interaction with user groups (Frome 1984, p. 294, quoting Behan 1981).

Sentiments similar to Behan's had been expressed long before, and would still be surfacing long after his critique. A 1962 internal Forest Service memo predicted an unhappy future for the balance between planning and management on the national forests:

> [In March 1962 a Forest Service staff member in Washington warned one regional forester to expect demands for] "urban planning"-style land-use allocations on the national forests. . . . A basic doctrine in our concept of multiple use is that change is a constant, so we design our plans to accommodate change. If there is one single feature in the tug-of-war today between the Forest Service and some recreation organizations, it is the desire to freeze our decisions and reduce management flexibility (Hirt 1994, p. 227).

My spring 2003 conversation with Jim Northup, previously the planner for the Green Mountain National Forest, more or less confirmed this 1962 prediction. Both the 1962 memo and the 2003 interview commented on the same need to shift players and resources from the game of *Capture the Forest* to the more complex game of *Changing Places*:

> [During the last round of planning for the Green Mountain National Forest], we organized a meeting that provided the foundation for some very fundamen-

tal changes in the management direction of the forest. . . . [We] recognized the validity of … public vision and values, and then we crafted a plan that moved us in that direction. . . . And then everything fell apart [laughs]

[Q: Why did it all fall apart?]

Because . . . as powerful as the vision was, what the agency tended to do was to look at . . . the standards-and-guidelines part. And it was like . . . [pause] like knowing the words to a song, but not the tune, if you know what I mean by that. The staff started just reading the plan literally and implementing the individual standards and guidelines, even when they were inconsistent with the larger vision. That was a part of where it . . . went south, honestly.

[And] the monitoring section of the plan is probably one of the weakest sections. . . . [The different participants in the planning process] took some time to . . . describe why [we needed particular kinds of research], and the nature of the research . . . needed . . . on a long-term basis, and often on a landscape level.

But this wasn't tied very well to the vision. . . . You need . . . not just indicators of the things that are easy to measure, but . . . qualitative indicators as well.

And you need a meaningful process that involves the public in this ongoing dialogue, about "is this the right vision, are we going in the right direction, what's this information telling us, what other information should we be collecting here, what other questions should we be asking ourselves?" . . . That ongoing dialogue just never happened after the plan was adopted and made official.

[That national forest] is now revising its management plan. It's approaching that plan revision in essentially the same way it did 15 years ago, as a process of land use planning and resource allocation — creating a sort of "zoning" map.

Instead of doing it the same way again, a much more profitable path for . . . any . . . national forest to take would be to invent the institutions that would better carry it, and the land, and the citizens, into the future, implementing that earlier plan. Because it didn't pay any attention to [long-term monitoring and research/assessment] in the first round, and there's a lot of that to be done. . . . The institutions are not thinking in that long time frame . . . and if they're not doing that, then forestry is not a subset of ecology, as I think it needs to be, or become (author's interview with Jim Northup, former planner for the Green Mountain National Forest, Montpelier, Vermont, March 17, 2003).

Just as Nancy Langston concludes that the frustration of managing the dynamic Blue Mountain forests could not be addressed by doing even more research on how to stabilize those forests; and just as Dave Clary concludes that the frustration of keeping forest-dependent communities alive could not be addressed by writing ever-tighter procurement and supply contracts; the frustration with planning expressed by these quotes from 1962 through 1981 to 2003 cannot be addressed by writing longer, more detailed, more "perfect" plans. All of these frustrations are rooted in the expectation that research, contracts, and planning should and can reduce uncertainty, whether by predicting the future scientifically; by specifying the desired future results of management in greater detail; or by some combination of both.

Just as conservationists may have something to learn from the history of urban redevelopment about the rhetoric and reality of "community stability," they may have something to learn from the history of urban development and land-use law about the rhetoric and reality of zoning and planning. It is easy to assume, for example, that zoning and planning were invented to curb the excesses of private real estate markets by stabilizing land uses. But it is at least as true that the real estate industry wanted and benefited from artificial stability. The more government could act to make future land uses predictable, the more profitable it became to speculate on the future uses of vacant land (Edel, et al., 1984 and Weiss 1987). In essence, plans and zoning can be seen as implicit contracts between governments and landowners, in which government reduces by fiat the list of future potential uses for particular parcels of land. A developer who can give buyers such a government-backed guarantee can sell a vacant lot next to many other vacant lots at much higher prices than one who must advise buyers that they face the nearly infinite list of possible neighbors permitted by an unregulated market, or created by changing technologies.

The U.S. Supreme Court has explicitly interpreted zoning and land-use regulations in just this way, by ruling that governments must compensate landowners for changes in zoning or regulations, particularly if a landowner had "distinct, investment-backed expectations" based on the previous zoning or regulations (see *Penn Central Transportation Co. v. City of New York*: 438 U.S. 125 [1978]; *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 [1992]). In other words, as long as a landowner has already filed a subdivision plan, or can demonstrate that she bought the land for the explicit purpose of subdividing and developing it, the public cannot rezone the land or forbid development without purchasing the earlier options back from the land owner. This interpretation of plans is a version of management-by-contract. To some extent, it freezes the landscape by "grandfathering" not only current land uses, but even

current landowners' *expectations* about future uses. If this is how zoning and land use planning really work (even some of the time), it is hard to imagine using them for adaptive management.

The role of planning in management-by-consequences is not to create such contractual obligations or guarantees about the future. Instead, it is to propose options for the future that are influenced, but not perfectly controlled or predicted, by the past. Interestingly, this is the way many successful businesses approach research, development, and marketing — at least when they are not pleading with public agencies to "reduce uncertainty" or "create a stable climate for investment." As Fred Bosselman notes,

> In the business schools, management theorists are increasingly embracing adaptive planning methodologies in response to . . . expectations of continuing change. [Strategic planning] dominated management theory in the 1980s. However . . . strategic planning [is] being abandoned in the face of empirical studies . . . demonstrating [its] ineffectiveness. . . . The emphasis has shifted from the plan as a document, to the plan as a process for analyzing new information that can confidently be expected but not predicted (Bosselman 2001, pp. 321–22).

In other words, private businesses use planning to anticipate, understand, and manage change. They envision change not only in markets (as sources of customers, labor, raw materials, services, plant sites), but also inside and among the firms themselves. In business, adaptive planning sees the relationship between any given human community and its environment much just the way Henry Chandler Cowles thought ecologists should treat the relationships between a plant community and its environment, as "a variable approaching a variable, rather than a variable approaching a constant" (quoted in Hagen 1992, p. 27). This is very much the way that planning and education theorist Donald Schön thought urban planning itself should operate (Schön 1983, p. 308), and that both Daniel Kemmis and Fred Bosselman think public natural resources should be managed.

Local governments approach many of their own decisions in the same way. Taxes are one excellent example. Taxes both respond to and produce crosscutting changes: in levels of income, in the distribution of income, in the value and uses of land. Most conservationists focus on the immediate, individual tax implications of land use and ownership changes, rather than on their long-term, cumulative effects. When trying to persuade both landowners and communities to put land into permanent conservation status, conservationists usually focus strictly on taxes as a cost. They point out that conserved land demands no town services, and argue that conservation makes economic sense even if takes land permanently off the tax rolls.

This is true enough as far as it goes. But as Lloyd Irland points out, "no one ever mentions that most existing residents also contribute less to tax revenues than to costs of services" (Irland 1999, p. 128). Mentioning this might make it inconveniently clear that the ideal town government is one that costs nothing, either because no one at all lives in the town, or because no one who does live there needs public services. For fairly obvious reasons, such a vision of the future may not be particularly appealing to rural local governments. Most do not look forward to a future of either emptying out, or replacing residents who rely on public services with more affluent ones who would use few or no public services, and would simply spend their money locally while earning it somewhere else.

This extreme outcome sounds absurd. Yet some rural New England communities have already stood on its brink. According to Irland, Maine's Tree Growth Tax probably accomplishes its intended goals of encouraging reforestation and long-term management of forestland. But it has also shifted the burden of paying for local services in small towns where most of the land is owned by paper companies, where the owners of house lots now pay assessments two to four times higher per acre than those paid on company forestland. "For small towns of forty to a hundred inhabitants, with low incomes and high unemployment, struggling to maintain municipal services, such a situation [is] intolerable," he concludes (Irland 1999, pp. 105–106).

Selectman Richard Clark of Ripton, Vermont, made the same point in response to plans for expanding the Green Mountain National Forest in 1977:

> Our residents care most about taxes and their own ability to remain in the area without being taxed off their land. . . . I don't care what the Forest Service wants . . . They are not going to get any more land in Ripton. . . . How much of the town can we afford to have taken out of taxation? (Shands and Healy 1977, p. 225)

Planning for forests and communities surely cannot qualify as adaptive unless it takes that question seriously. Management-by-consequences requires treating taxation, not simply as an obstacle or incentive, either to reforestation or to the acquisition of conservation easements, but as an expression of membership in a community, a way of paying expenses that local residents have agreed to share, in large measure because they could not afford them one household at a time.

State governments, like federal agencies but unlike many conservation nonprofits, have long grappled with

this issue. In the midst of the Depression, when many individual landowners were happy to sell their land to the federal government, the state of Vermont gave local towns the right to approve or forbid the sale of land within their boundaries to the Green Mountain National Forest. Ever since, the Forest Service has recognized that its capacity to "complete" that forest requires maintaining good relations with town selectmen, between as well as just before land sales (Conrad 1997, p. 136). The state of New York has taken a different approach, by reimbursing towns for revenues foregone through current-use taxation for forestry and agriculture (McMartin 2002, p. 283).

Many private conservation organizations, however, have given little to no attention to the long-term local economic and fiscal history or viability of human enterprises, including both local governments and their own organizations. The internal management histories of many such organizations consist of repeated, opportunistic booms-and-busts. As membership and grant funding balloon and then collapse, they expand their staffs quickly, only to pare them down just as quickly a few years later. They tend to reorganize their priorities completely under each new president or executive director. It is not hard to understand why local governments anchored to a single place, and buffeted by stormy real estate and job markets, might take any advice offered by such boom-and-bust organizations with a grain of salt. Conservationists could take an important step toward adaptive management and planning by taking the time to understand the local history of economic development, taxation, and government finance in the places they hope to save or protect.

The results of such adaptive planning, or planning-as-historical-research, would probably look less like the plans currently produced under the National Forest Management Act, and more like the capacity-building work of organizations like the Northern Forest Center. NFC has a very small staff, deliberately based all over northern New England. Like many conservation organizations, it has chosen to pursue stronger bottom-up community credibility, at the risk of weaker top-down internal control. In contrast to most other conservation organizations, however, NFC has also made bottom-up, community-based history an important component of its programs. One of the center's most interesting current projects is a traveling exhibit:

> **Ways of the Woods: People and the Land in the Northern Forest** . . . [an] interactive mobile exploration of past, present and future relationships between people and the Northern Forest landscape [that will include] . . .
> - a mobile educational exhibition of regional history and culture, mounted within an 18-wheel truck;
> - education programs for school groups and the general public, delivered . . . in communities around the region and beyond;
> - community forums to explore regional and local issues; and
> - live performance and demonstration of traditional Northern Forest arts and folkways.

Ways of the Woods obviously sounds, as it is intended to, a lot more entertaining than traditional comprehensive planning (the approach mandated by NFMA), or even strategic planning. But unlike traditional "edutainment" programs, or museums designed as "destinations," this one aims less to attract tourist dollars than to help people, businesses, and communities in the Northern Forest think creatively about current public-policy and land-management issues:

> In recent years, . . . as traditional industrial landowners respond to the economic pressures of a globalizing industry, millions of acres of forestland are changing hands, and communities are struggling to respond to mill closures, layoffs, and out-migration by young people. . . .
>
> *Ways of the Woods* will . . . explore the story of people and their ever-changing relationships with the forested landscape, of people continually responding to the challenges and opportunities presented by the natural world around them, and to global forces that have led to dramatic environmental and cultural transformations.

CONCLUSION: BUILDING NEW FOREST MANAGEMENT COMMUNITIES
With Special Reference to Southern New England and Massachusetts

One challenge of adaptive management is creating management communities that care enough about the potential impact of their decisions on future generations to avoid casual stupidity in the present. Without that motivation, "adaptive management" can simply become a convenient excuse for random, short-term changes in policy.

But a second and more profound challenge of adaptive management is building management communities that not only solve problems, but also recognize that even the best solutions inevitably produce new problems to solve. Such communities will approach history, not as a pile of facts that should be boiled down into lessons or recommendations, but as an ongoing and never-finished *activity:* people working together to remember, recount, and reanalyze the past from the ever-changing perspective of the present. As an activity, history can be a critical tool for

building "sadder but wiser" communities in many different settings, from staff training and program evaluation to public outreach.

Problems in Space: Forest Ownership and Access

Policy analysts have often focused on forest "fragmentation" as an obstacle to creating forest management communities. Yet it is worth asking whether fragmentation is a problem because it hurts forests, or mostly because it frustrates foresters. Many calls for regional, coordinated forest policy sound like those championed by the original Progressive foresters, whom Samuel Hays characterized as attacking monopolies in theory, yet favoring them in practice. Unlike small-scale enterprises, large-scale ones can afford to sacrifice current for future opportunities, and their decisions affect large areas of the landscape relatively quickly. Just as Gifford Pinchot wanted the national forests to serve the "greatest good of the greatest number" of people, forest policymakers are often impatient to do what they see as the greatest good for the greatest number of trees in the shortest possible time. From that perspective, large-scale owners make more appealing partners than small-scale ones.

Yet the experiences recounted by historians such as Nancy Langston, Paul Hirt, and Robert McCullough suggest that it may be just as important to *avoid* applying current knowledge and advice quickly to large landscapes. Adaptive management is necessary precisely because today's "best practices" often become tomorrow's object lessons.

Land fragmentation may well be a case in point. The experience of three centuries or more suggests that the relationship between the scale of land ownership and land-use practices is indirect, rather than direct. Rural New England has gone through at least two rounds of ownership fragmentation. During the original process of European settlement, the holders of large-scale land grants made more money by subdividing and selling the land than by using it. In the late twentieth century, the owners of large industrial forests appeared to be taking the same path. Yet there was a critical difference between the two experiences: The first round of fragmentation put the land mostly in the hands of people who made a living from it (at least for a generation or two). The second round seemed likely to put the land mostly in the hands of people who saw it primarily as recreational or speculative real estate. Forest management changed from one of these periods to the other, not because of changes in the scale of ownership, but because of the landowners' changing expectations and knowledge.

Richard Judd's history of local environmental knowledge in nineteenth-century northern New England suggests strongly that small-scale landownership need not, *in and of itself,* lead to neglect or mismanagement of natural resources. Judd portrays the smallholders and enterprises that dominated the economy of northern New England until about 1880 as strongly motivated to understand and use land and water carefully. This was true particularly of those who, as another New England historian has put it, "stayed behind" after the migration to Ohio and points west (Barron 1984): "Although farmers were suspicious of theory passed down from elites, they were far from closed-minded. Popular natural history was steeped in the everyday details of farm management and charged by the quickening influence of inbred curiosity, new observations, the drive to increase the productivity of the land, and the argumentative bent of the New England mind. . . . With low overhead expenses and irregular schedules, the small mills and shops [also] used wood conservatively" (Judd 1997, pp. 71, 100).

More recent history has drawn the other side of the coin, showing that large-scale land ownership does not, *in and of itself,* always keep the work in working landscapes. During the economic boom of the 1990s, for example, Massachusetts's farmland preservation program found that easements prohibiting subdivision did *not* prevent the conversion of working farms to rural estates. Very wealthy recreational owners could purchase farms and keep them whole, while still changing the uses and meanings of the landscape radically.

It is hard to imagine a market for purely recreational forest "estates" in the hundreds of thousands of acres. Then again, capitalism specializes in producing things that were once unimaginable. In rural Maine, for example, this apparently unimaginable outcome is not very different from the future envisioned by groups such as *Restore: The North Woods,* though they are arguing for large-scale public rather than private ownership.

The strongest opposition to such proposals comes from people who see land ownership by large, usually regional or national nonprofits, or by state or federal governments, not as a mechanism allowing people to share the costs of owning resources they could not afford to acquire individually, but as a way for outside interests to expropriate local resources. Judd quotes one Maine farmer's eloquent complaint about land use restrictions imposed in rural areas at the insistence of urban hunters and anglers in 1899:

> "[You are not permitted to kill game on your own land nor catch fish in your own streams. . . . Your forests are ruined by fires set by these roving hunters, and you are blamed for not caring for your woodland, and threatened with restrictive laws to define what you shall cut when you want a set of sled stakes." Under this growing complex of conservation laws, he asked,

"How much better off are the farmers of new England than the peasant tenantry of Europe?" (Judd 1997, pp. 197 ff).

Conservationists need to acknowledge that rural opposition to large-scale land conservation is not based on greed or ignorance (or at least, not based on any more greed than are the personal real investments of conservationists themselves), but grows out of a very real and long history of urban interests acquiring rural resources, then excluding local residents from their use — culturally and politically, if not economically or legally.

Building management communities thus requires what the U.S. Forest Service calls I&E — information and education. One Massachusetts experiment has suggested that simply sharing regional spatial information, at a scale that is meaningful to individual landowners, encourages them to begin seeing themselves as part of a regional forest management community (Finley, 2002); landowners reportedly asked the experimenters eagerly, "When are you coming back?" with the next year's information.

At most spatial and temporal scales, however, I&E are both hobbled by a kind of Catch-22: government foresters resort to I&E primarily as a consolation prize for losing the battle to impose public regulation on private forest practices. But landowners have little reason to listen to government foresters who have no regulatory authority. State foresters in states such as Massachusetts, which regulates forest cutting practices, are in a slightly better position than federal foresters. But even state foresters are often stymied by the double negative challenge of getting landowners, not to stop practicing destructive forestry, but to stop practicing no forestry.

The strongest argument for conservation easements as a pro-land-management tool (as opposed to an anti-land-use-conversion tool) is that they create new, micro-communities of forest management, by splitting the ownership of land *explicitly* among people who already had an *implicit* stake in how that land was used. All land management requires conversation, whether that conversation is a single landowner wrestling with his or her conscience, or a public official confronting a landowner who has ignored a legal requirement or regulation. Shared land ownership can make such conversations something to plan for or even look forward to, rather than something to dread or just survive.

Conservation easements are far from the only way to create such joint-ownership conversations, however. Family forests are a particularly promising kind of management community, which has recently attracted new attention from both private funders and governments (see Web sites for Vermont Family Forests, Wisconsin Family Forests, and the Family Forest Foundation, based in Washington state). Not surprisingly, and perhaps more than in any other form of forest ownership, the owners of family forests think in forest time because they care strongly about the consequences of their decisions for future generations.

Forest cooperatives are another option, though they have succeeded more often in romantic urban imagination than in rural economic reality. During the Great Depression, the U.S. Forest Service funded and even staffed the Otsego Forest Products Cooperative Association (based in Cooperstown, New York) as a "research project" of the Northeastern Forest Experiment Station (Schrepfer and Maunder 1973). National and regional policy debates about forest "commons," both internationally and within the United States, produced a new surge of research and philanthropic interest in cooperatives in the 1990s (see the Web sites of the Massachusetts Woodland Cooperative, which operates in central and western Massachusetts; the University of Wisconsin's Center for Cooperatives; and the National Network of Forest Practitioners; for a good overview of the history of forest cooperatives in the United States, see Smith 2001).

Other forms of shared ownership that have been applied mostly in urban areas could in theory be used to build public-private management communities for forests in places like western Massachusetts.

Business Improvement Districts (BIDs) are much like rural Resource Conservation and Development Districts, with the critical difference that a BID has some power of taxation. BIDs tax property owners in a small area for shared investments within that area. Usually those investments involve street lights, plantings, sidewalks, or maintenance to make the entire area more attractive to potential customers, and thus benefit all the area's businesses. Government must usually designate areas where BIDs will be permitted, then individual BIDs are created by a simple or two-thirds majority vote of the property owners within each district's proposed boundaries. Once a BID has been created, however, it can tax even those local property owners who voted against it. This gives all property owners within the BID a strong incentive to participate in management, to make sure that they benefit from the taxes they pay. Government and nonprofit organizations might collaborate to create rural Forest Management Districts (FMDs) modeled after urban BIDs.

Like forest cooperatives, transferable development rights (TDRs) have worked more often in theory than in practice, but are also worth considering in places like western Massachusetts, which face significant market pressure to convert land from resource production to recreational or second-home development. TDRs have been used to channel development pressure from neighborhoods that cities

would like to preserve to others where they want new investment or higher-density development. TDRs link the owners of land in the two areas into a single planning and management community, by requiring developers who want to build in a designated "receiving area" to purchase additional development rights (in essence, conservation easements) from a designated "sending" area. In theory, this produces more compact or higher-density development in the receiving area, and preserves open space or working landscapes in the sending area, while compensating landowners in the latter for their development rights. TDRs will only work if the land market in both areas is strong enough to withstand the imposition of additional regulatory restrictions, such as the requirement to purchase additional rights in the receiving area. If no one wants to develop in the receiving area, there is no demand for transferable rights. If no one in the sending area wants to develop, or sell their land for development, there is no real supply of transferable rights. A version of TDRs called "development credits" was a key component of planning for the New Jersey Pinelands National Reserve. The New Jersey program has channeled new housing into some designated receiving zones, but this and similar experiments have not always worked as quickly as predicted, because of faltering or shifting land markets (see Planners Web and New Jersey Pinelands Commission Web sites).

Finally, community land trusts are another institution that might be adapted for shared forest ownership. CLTs have been used primarily to develop affordable housing, in both rural and urban areas (see the Web site of the Institute for Community Economics). CLTs generally assign ownership of the land itself in perpetuity to a nonprofit trust, but lease portions of that land to individuals and households, who then own the homes built on the land. The homeowners can invest in or sell their homes, and reasonably expect the value of their investments to appreciate as the cost of building similar houses increases, or as their personal improvements add to a home's value. But because the trust owns the land itself, it also owns any appreciation in the underlying value of the land. CLTs help to guarantee the long-term affordability of housing because rises in land prices are often the major component of rising prices for housing. Yet appreciating land values usually reflect public rather than private improvments (roads, schools, public services) or general market speculation in future land use changes (such as shifting land from farming or forestry to residential or recreational uses). The same basic mechanism of shared ownership might be used to guarantee the long-term affordability of land to people or enterprises that want to make a living from the land itself, by having a trust own the land but allowing individuals or businesses to own certain resources on, or use rights to, the land. This mechanism is already being used for community-supported farming (see the Web site of Equity Trust, Inc.) But it is also under discussion for forestry (in a recent proposal circulated by Vermont-based consultant Deb Brighton).

The Problem of Time:
Applied History for Forest Management

Unfortunately, none of the tools described above for sharing the ownership or control of forested land necessarily address the challenge of management-by-consequences over time. As Robert McCullough points out, viewing scenery or creating nature sanctuaries provides "instant gratification," but forest production requires "consistent management and patient vision" (McCullough 1995, p. 299). For much of New England's "southern forest," including the forests of Masschusetts, the challenge is less to sustain existing working landscapes than to *put the history of work back* into what are now perceived as static, pristine, workless landscapes.

Many environmental advocates and policymakers simply do not see either history or work embedded in such landscapes (White in Cronon 1990). For three or more human generations, urban policymakers and vacationers have read and valued much of Massachusetts's forest primarily as a collection of scenic or ecological snapshots. In contrast, people who have relied on the land for a living tend to see the very same landscapes as tangled, complex stories of growth, loss, and struggle. As John Elder puts it for Vermont's "northern forest,"

> During the decades in which many parts of the [U.S.] were ravaged by the mandates of prosperity, Vermont grew wilder and greener every year. Economic stagnation protected the unspoiled countryside, with its network of villages. But there was too much suffering in these failed homesteads to allow for easy celebration, and a legacy of poverty remains in many of the hill towns . . . The wilderness areas designated in Vermont during the past 14 years are the climax of a century of enhancement through impoverishment (Elder in Klyza and Trombulak 1994, pp. 220–21).

Pursuing forest preservation on a time scale of years, while forgetting the decades of rural poverty, industrialization, and decline that laid down the patterns and meanings of the forest, does more than raise fundamental questions of social equity. It is profoundly ahistorical, and thus an obstacle to management-by-consequences.

Shared ownership does not, in itself, always overcome this obstacle. Family forests usually acknowledge it, but it can remain invisible in most other shared-ownership

arrangements. Whether they are full or only partial owners, people who have never worked the land may find it difficult to visualize both the past decisions and investments their land now embodies, and the future landscapes being created by their present choices.

How can a forest's history of work be made visible and continuous again, once it has been forgotten or become invisible? For confronting this dilemma, the Forest Service's location within the Department of Agriculture may be a significant asset. Keeping an unwavering, if sometimes myopic, eye on the prize of timber production over the decades has certainly led the U.S. Forest Service to do many things it should now regret. But on the plus side, that focus has always kept the Forest Service strongly connected to landscapes of production, and may therefore qualify it to provide the kind of I&E that are needed to induct everyone who uses wood or paper (or water, or air, for that matter) into a new forest management community. Conversely and undoubtedly not by design, the trend in many largely urban states toward basing state forestry agencies in departments focused on outdoor recreation could easily make this particular kind of community building more difficult. Massachusetts has just completed such a reorganization. This layers challenge on top of challenge: connecting forest producers with forest consumers, while also connecting foresters with the designers and managers of urban parks. Both of these challenges are important, and neither should be ducked. But tackling them both at once is particularly daunting.

In Progressive fashion, the USDA's research and education programs long focused on the "most efficient" producers, usually the largest. Yet in the past decade or so, as the proportion of farmers in the U.S. voting population finally dropped below one percent, the USDA began searching for and discovering a new and much larger constituency: not just people who grow food, but people who eat food. Although the vast bulk of federal farm programs and subsidies still cater to large, agro-industrial enterprises, a small but significant sliver of the USDA's budget now supports urban and community-supported agriculture projects, which aim explicitly to make the whole ecological, economic, and social process of food production visible and meaningful to consumers. Rather than rely solely on increasingly sophisticated legal contracts to anticipate and forbid undesirable change, these new farm projects are building partnerships between farmers and communities, helping them to develop a shared capacity to manage both positive and negative change over time.

In 1977, in the midst of controversy over changing ownership patterns in New England's northern forests, the manager of Brown Company woodlands in northern New Hampshire made an eloquent case for building forest management communities of this very sort, communities that would include not only everyone who grows trees, but everyone who uses them — including many people who do not even *know* they use trees:

> People who use the national forest should be exposed to the harvesting of timber — and realize that the forest products they use day in and day out have to come from somewhere. The national forest should serve as an educational tool. People shouldn't feel badly when they see a stump. Instead they should ask, "What was that tree used for?" (John H. Bork quoted in Shands and Healy, 1977, pp. 6768).

There is serious merit in Bork's argument, especially if it can include, not just an urban audience's direct but relatively rare experiences in the woods, but that same audience's direct, everyday experience of using what the woods produce.

Helping people read both forest products and forest landscapes as histories of production is now the explicit goal of several innovative projects in the northern forest. The Northern Forest Center's *Ways of the Woods* traveling exhibit, for example, will make the history of woods work visible to anyone who lives and works near the Northern Forest, and not just to landowners and loggers. With the Forest Stewardship Council (and the Wilderness Society!), Maine WoodNet is pioneering the use of "chain of custody certificates," which will document for consumers everyone who has participated in an object's production, at every step from growing the tree to final delivery.

For forests, management-by-consequences requires a sense of community memory and a capacity for community learning over dozens of growing seasons, rather than the single season required to observe and understand the life history of a tomato, from soil preparation to salad. Forestry may also require more than the quarter-acre vacant lots that support many community gardens. Yet community-supported forestry could make the entire chain of custody for forest products visible within many, if not most, of the places that can accommodate community supported agriculture (Donahue 1999, and the Communities Committee of the Seventh American Forest Congress, which uniquely among community forestry organizations, brings rural and urban practitioners together).

People who have learned to read nearby forests as histories are surely more likely to ask long-term questions about both the history and the future of far-off forests. The major challenge for both kinds of forests is the same as for adaptive management in general: building communities that can last long enough to see, and remain open enough to question, the connections between causes and consequences in forest time.

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