REWEAVING THE LANDSCAPE: THE INSTITUTIONAL CHALLENGES OF ECOSYSTEM MANAGEMENT FOR LANDS IN PRIVATE OWNERSHIP

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INTRODUCTION

The abrupt sale, subdivision, and development of forested lands in northern New England and New York in the 1980's triggered deep concerns about the future of the region.[1] This vast area of transitional spruce-fir and hardwood forests, covering over twenty-five million acres, and located within a day's drive of seventy million people, had largely escaped the urbanization that spread across the rest of the northeastern United States.[2] Now, it seemed, unbridled real estate development might bring environmental degradation, loss of recreational opportunities, and loss of jobs and community viability in an area economically dependent on forest industries. But the concerns about the forest soon grew to encompass the soundness of timber harvesting practices by existing owners and the overall economic and environmental fate of the region.[3]

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1. The key event that brought a sense of crisis was the 1988 sale of portions of the nearly one million acres of the former Diamond International Corporation in northern New England and New York, following a hostile takeover of the company. For an account of the land sales and other transactions that were involved, see Land Conversion Subcommittee, *Summary of Proceedings: Forum on Land Sales of Coburn Lands Trust and Former Diamond International Corporation* 1, 23-67, *in* NORTHERN FOREST LANDS COUNCIL, TECHNICAL APPENDIX: A COMPENDIUM OF TECHNICAL RESEARCH AND FORUM PROCEEDINGS FROM THE NORTHERN FOREST LANDS COUNCIL § 2 (1994) [hereinafter TECHNICAL APPENDIX]. The financial considerations of large landowners in the region leading to land sales and conversions in use are discussed in Robert H. Whitney, *Forces for Change in Forest Land Ownership and Use: The Large Landowners' Situation*, *in* CONSERVING THE NORTH WOODS: ISSUES IN PUBLIC AND PRIVATE OWNERSHIP OF FORESTED LANDS IN NORTHERN NEW ENGLAND AND NEW YORK 72-96 (Clark S. Binkley and Perry R. Hagenstein eds., 1989) [hereinafter CONSERVING THE NORTH WOODS]; STEPHEN C. HARPER ET AL., U.S. DEP'T OF AGRIC., THE NORTHERN FOREST LANDS STUDY OF NEW ENGLAND AND NEW YORK 8-21, 104-115 (1990) [hereinafter NFLS]; SPENCER R. PHILLIPS, THE WILDERNESS SOCIETY, FOREST PRODUCTS MANUFACTURING: FACTORS AND TRENDS AFFECTING THE WORKING FOREST (1993).

2. NFLS, *supra* note 1, at 1, 7.

3. *See id.* at 166-75 (addressing issues of forest health raised in letters and public meetings); Carl Reidel, THE NORTHERN FOREST: OUR LAST BEST CHANCE, AMERICAN

A striking feature in the litany of worries is the identity of the worriers. The greatest fears have been those of people who do not hold title to the land. More than eighty percent of the forests of northern New England and New York are owned by corporations and individuals, even when the extensive state-held lands of New York are included in the calculation.[4] The people who depend on the land being used and maintained in a particular way, without claims to ownership, include forest industry employees; local residents who use the land for hunting, fishing, camping, and other activities in accordance with local custom; and tourists from outside the area who come primarily for recreation and to enjoy the scenery.[5]

More broadly, people both within and outside of the region depend upon, and care about, the biological diversity of the forests and the overall functioning of the ecosystem.[6] The implications and definition of this broader stake in the forest became the subject of an especially contentious debate. The assertion of interests of non-owners in the underlying system of natural resources management has raised basic questions about the autonomy of property owners, the definition of public interests, and the appropriate scope of government intervention.

In 1988, the specter of rapid environmental and economic changes across the region led Congress and the governments of Maine, New Hampshire, Vermont, and New York to initiate a process for investigating facts and developing regional policy recommendations. The process began with the Northern Forest Lands Study of the United States Forest Service[7] and the work

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FORESTS, May/June 1990, at 22-25, 74-77 (describing mobilization to address concerns about the Northern Forest); NORTH WOODS, *supra* note 1, at 1-2 (Introduction).

4. These figures refer to the area known as the Northern Forest Lands Study Area, which became the subject of government-sponsored investigation and proceedings. NFLS, *supra* note 1, 4-7, 91. This administrative definition encompasses areas predominantly owned as large tracts, excluding areas mainly held in smaller parcels. The reported figures therefore do not purport to cover the entire forest ecosystem of the region. *Id.* at 91. There are some large areas in public ownership, notably the lands held by New York in the Adirondack Park, the White Mountain National Forest (mainly south of the "study boundary") and state park lands in central Maine. *Id.* at 6-7. But it is the privately-held lands that have been the focus of the debates examined here.

5. NFLS, *supra* note 1, at 25-28; Tommy L. Brown, *Outdoor Recreation and Tourism Studies Applied to the Northern Forest Lands: Literature Review and Analysis*, *in* TECHNICAL APPENDIX, *supra* note 2, § 7, at 4.

6. NFLS, *supra* note 1, at 24-25.

7. NFLS, *supra* note 1 (prepared pursuant to Act of Sept. 27, 1988, Pub. L. No. 100-446, 102 Stat. 1803-1810).

of the Governors' Task Force on Northern Forest Lands.[8] The process has now concluded six years later with the issuance of final recommendations by the Northern Forest Lands Council, an entity made up of representatives from each of the four states and the U.S. Forest Service, created for the purpose of continuing the initial investigations.[9]

The need for management of forest ecosystems to achieve "sustainability," and for innovative approaches to attain that goal, have been pervasive themes in these proceedings.[10] The call for new approaches to forest conservation is well captured in an often-quoted speech that Mollie Beattie, now head of the U.S. Fish and Wildlife Service, gave two years ago when she was Executive Director for the Richard A. Snelling Center for Government. Asserting that "what is at stake here is a last best chance to reframe conservation for the twenty-first century, and it is a chance we can lose through inaction and old thinking," she urged her audience to take bold and innovative action:[11]

> There are no comfortable techniques to re-use. Pretty soon, the time for comfortable data-gathering and mapping will be over. There will be only two choices. The first will be to buy up a couple of reserves, and offer up a few standard economic development programs; effectively, to declare victory and get out. The second will be to take a risk that is as big as the Northern Forest itself, that of truly conserving all of this special place before it is gone, without our old techniques, our old suspicions and our territorial myopia. No more metaphors and maps. Think big. Trust each other. Do something bold.[12]

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8. GOVERNORS' TASK FORCE ON NORTHERN FOREST LANDS, THE NORTHERN FOREST LANDS: A STRATEGY FOR THEIR FUTURE (1990).

9. NORTHERN FOREST LANDS COUNCIL, FINDING COMMON GROUND: CONSERVING THE NORTHERN FOREST (1994) [hereinafter COMMON GROUND]. The council consisted of four members appointed from each of the four states, and one representative of the U.S. Forest Service. *Id.* at i.

10. *See id.* at 41-45, 61-64, A-23-A-32.

11. Mollie Beattie, *The Northern Forest as a New Commons: A Response from a Public-Private Partnership Perspective*, *in* THE WILDERNESS SOCIETY, CONFERENCE REPORT: SUSTAINING ECOSYSTEMS, ECONOMIES, AND A WAY OF LIFE IN THE NORTHERN FOREST 109, 110 (1993) (proceedings of a conference held at the University of Vermont, Burlington, Nov. 12-13, 1992) [hereinafter SUSTAINING ECOSYSTEMS].

12. *Id.*

This statement highlights several dominant themes advanced in the Northern Forest proceedings. Important values are being left out of current management decisions affecting natural resources, but existing legal tools and government programs are inadequate to the task of accounting for them. Part of the problem with existing arrangements is an allegiance to previously drawn boundaries that allocate resources, assign management authority, and narrow the analysis. Any solution will be accomplished only through collective decision-making and coordinated action on a large scale, but achieving the necessary self-organization will be a difficult task that requires boldness and trust. These contentions challenge the decision-making of current owners and government regulators alike, and demand a search for new institutional arrangements that cross property lines and political boundaries in order to achieve regional, ecosystem-wide coordination.

As the Forest Service, the Governors' Task Force, and the Northern Forest Lands Council faced this call for coordination and planning, the proceedings became a forum for debating complex issues relating not only to substantive goals, but also to the allocation of control. Who should decide the fate of the forest? For a time, while the threat of rapid domino-like land conversions seemed imminent, it appeared that the Northern Forest proceedings might provide a regional forum for reconfiguring the organization of decision-making authority.[13] The discussions opened a Pandora's box of views relating to the role of corporations, individuals, families, local communities, state agencies, non-profit organizations, the federal government, and yet-to-be-created regional entities.[14] The Northern Forest Lands Council devoted considerable effort to examining the potential

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13. Carl Reidel has chronicled the rise and fall of hopes for major institutional change in a series of articles. *See* Reidel, *supra* note 3; Carl Reidel, *A Public/Private Cooperative Paradigm for Federal Land Management*, *in* HOUSE COMM. ON INTERIOR AND INSULAR AFFAIRS, 102D CONG., 2D SESS., MULTIPLE USE AND SUSTAINED YIELD: CHANGING PHILOSOPHIES FOR FEDERAL LAND MANAGEMENT? 145, 161-63 (Comm. Print 1992) [hereinafter Reidel, *A Public/Private Cooperative Paradigm*]; Carl Reidel, *Endgame for the Northern Forest?*, AMERICAN FORESTS, Mar./Apr. 1993, at 29.

14. The array of viewpoints on these issues was well-summarized by the speakers in a 1992 conference organized by the Wilderness Society. *See* SUSTAINING ECOSYSTEMS, *supra* note 11. *See generally* ADIRONDACK COUNCIL ET AL., A FOREST AT RISK: THE CITIZENS' AGENDA FOR SAVING THE NORTHERN FOREST (1994) (summarizing comments presented at listening sessions conducted by the Northern Forest Lands Council).

forms that legal arrangements among various entities might take.[15]

Ultimately, with the pace of land conversions momentarily slowed by economic recession, and motivated by a mandate to conclude the proceedings with a consensus, the Northern Forest Lands Council offered no recommendations for broad institutional change. The final report confirms the importance of maintaining ecosystem integrity throughout the forest, but leaves proposals for major institutional innovation aside. The Council emphasizes tax policy changes, technical assistance, voluntary transactions, and education as ways of encouraging current owners to keep their land in existing uses, and it calls on the individual states to review the adequacy of laws and regulations on forestry practices.[16]

While the council's efforts have now come to a close, the debate over the form that "conservation for the twenty-first century" should take undoubtedly is not over. The six years of proceedings raised many more questions than they answered; they are best seen as one chapter in a longer endeavor in multiple forums to invent workable institutional arrangements.

The implications of that larger enterprise extend beyond the boundaries of the Northern Forest. The debates were not only the beginnings of an effort focused on a particular region of the country, but also a manifestation of a broader emerging discussion about the role of privately owned lands in national and international efforts to manage ecosystems. While the story of the Northern Forest proceedings is colored by the personalities of the participants, the characteristics of local culture, and the problems of a specific time and place, the import of the endeavor is not limited to that setting.

This article seeks to put the Northern Forest proceedings in the context of the larger debate about ecosystem management. Like the Northern Forest proceedings, these broader discussions are motivated in part by a rapidly expanding scientific understanding of ecological phenomena,[17] and by concerns that existing institutional arrangements are inadequate to ensure the

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15. *See* Phyllis Myers, *New Directions in Conservation Strategies: A Reconnaissance of Recent Experimentation and Experience, in* TECHNICAL APPENDIX, *supra* note 1, § 4 at iii-v.

16. COMMON GROUND, *supra* note 9, at 21-92.

17. *See infra* part I.

long-term provision of renewable resources, survival of species, and functioning of ecosystem processes. The discussions are characterized on the one hand by an ever more global view of the problems of resource exploitation and a demand for central coordination of human activities, and on the other hand by an appreciation of the need for highly diverse, localized solutions closely tied to the biological and cultural peculiarities of different places.[18] These two perspectives, the global and the local, though so clearly linked, are in tension. The search for an adequate response to new scientific information is therefore dominated by a quest for some mediating institutional arrangements to meet international and national goals while fostering the autonomy of individuals and local communities.[19] The Northern Forest proceedings exemplify the difficulties of that search.

This article first examines the nature of advances in scientific understanding and the incorporation of the new ecological awareness in recent formulations of ecosystem management goals. The second part discusses the challenges that ecosystem management goals pose to existing institutional arrangements for managing natural resources, focusing on the particular difficulties of bringing about ecosystem management on lands that fall outside of government ownership. Neither government-owned parks, nor an expanded centralized regulatory system, nor a market-based approach appear to offer any unitary solutions to the complex issues posed by ecosystem management goals.

In the third part, the article examines the promise and the difficulties of proposals for institutional change that recognize multiple authoritative entities while seeking to mediate the tensions among them under the rubric of "new partnerships." Partnership rhetoric currently dominates the proposals of government agencies, non-profit organizations, and large corporations for achieving ecosystem management goals. Partnership arrangements entail the negotiation of coordination mechanisms among organizations, while fostering the semi-autonomous operations of each as a separate actor. At least in the more sweeping versions, partnership proposals would erode distinctions between public and private functions, creating

18. *See infra* part II.

19. *See infra* part III.

ongoing public/private arrangements that amount to ecosystem-based governance structures.

Finally, the article argues that while the rhetoric of partnership suggests a non-coercive solution to environmental issues, in fact the government role is vital in setting the stage for voluntary arrangements, in allocating power that affects bargaining positions, and in enforcing agreements. Partnership arrangements are unlikely to provide a comprehensive approach to ecosystem management without an exercise of government authority that is more assertive than seen in the Northern Forest proceedings.

I. ECOSYSTEM MANAGEMENT AND THE GOAL OF SUSTAINING ECOSYSTEM INTEGRITY

A. Advances in Scientific Knowledge About Ecosystems

Recent work in the biological and ecological sciences, particularly in the new multidisciplinary science of conservation biology, has brought new understandings of the diversity of life and of the complex dynamics and evolution of ecosystems.[20] The numbers and variations of genes within species, and of species within regions, as well as the associations of species within communities, and the ways that they interact with each other and with their physical environment, have all been subjects of increasing study.[21] Through improved methods of measurement and analysis, including satellite imaging and computer modeling, knowledge about ecosystems has been accumulating at a rapid

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20. An excellent introduction to conservation biology, including a thorough bibliography, is provided by RICHARD B. PRIMACK, ESSENTIALS OF CONSERVATION BIOLOGY (1993). For the first detailed overview of the subject see CONSERVATION BIOLOGY: THE THEORY AND PRACTICE OF NATURE CONSERVATION PRESERVATION AND MANAGEMENT (M.E. Soule & B.A. Wilcox eds., 1980).

21. The term "biological diversity" refers broadly to the variety and variability of ecosystems, species, and genes in nature. OFFICE OF TECHNOLOGY ASSESSMENT, TECHNOLOGIES TO MAINTAIN BIOLOGICAL DIVERSITY 3 (1987); JEFFREY A. MCNEELY ET AL., CONSERVING THE WORLD'S BIOLOGICAL DIVERSITY 17, 18 (1990). A readable discussion of the growth of scientific knowledge in the area, and implications for policy-making, can be found in EDWARD O. WILSON, THE DIVERSITY OF LIFE (1992). *See also* BIODIVERSITY (E.O. Wilson ed., 1988).

pace,[22] although precise predictions of events in ecosystems remain impossible because of their complexity.[23]

Organisms, including human beings, are dependent on the functioning of ecosystems. From small-scale phenomena in local habitats to global climate changes, the complexities of the world's life and its "life-support systems" are becoming better understood.[24] At the same time, the accelerating destruction of biological diversity and the disruption of ecosystem functions worldwide through human activity are now the subjects of ever more thorough documentation.[25] It has become clear that without efforts to further control the impacts of humans on their environment, species will continue to decline and go extinct at an unprecedented rate, and natural processes that people and other organisms depend upon will be irrevocably altered.

B. Ecosystem Management Approaches

The notion that natural phenomena are dynamically interconnected is not new,[26] but the recent advances in scientific information about ecological interconnections and dependencies are causing a pronounced shift in the formulation of goals and the means for achieving them.[27] The now-widespread references to

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22. *See generally* ENVIRONMENTAL INFORMATION MANAGEMENT AND ANALYSIS: ECOSYSTEM TO GLOBAL SCALES (William K. Michener et al. eds., 1994) (discussing advances in technology affecting analysis of environmental information).

23. The impossibility of accurate prediction is discussed further in text accompanying notes 37-38, *infra*.

24. WORLD RESOURCES INSTITUTE ET AL., GLOBAL BIODIVERSITY STRATEGY (1992); THE WORLD CONSERVATION UNION ET AL., CARING FOR THE EARTH: A STRATEGY FOR SUSTAINABLE LIVING 27-28 (1991).

25. WILSON, *supra* note 21, at 215-280; PRIMACK, *supra* note 20, at 75-198; Paul R. Ehrlich, *The Loss of Diversity: Causes and Consequences*, in BIODIVERSITY, *supra* note 21, at 21.

26. *See* R. Edward Grumbine, *What Is Ecosystem Management?*, CONSERVATION BIOLOGY, Mar. 1994, at 27, 28-29 (reviewing the historical development of the ecosystem management concept, beginning with the work of the Ecological Society of America's Committee for the Study of Plant and Animal Communities in the 1930's and the contributions of Aldo Leopold in the 1940's).

27. *See* A. Dan Tarlock, *The Nonequilibrium Paradigm in Ecology and the Partial Unraveling of Environmental Law*, 27 LOY. L.A. L. REV. 1121, 1121-44 (1994) (examining the shift from a balance-of-nature equilibrium paradigm to a complex, stochastic, nonequilibrium paradigm). *See also* Bryan G. Norton, *A New Paradigm for Environmental Management*, *in* ECOSYSTEM HEALTH: NEW GOALS FOR ENVIRONMENTAL MANAGEMENT 23-41 (Robert Costanza et al. eds., 1992) [hereinafter ECOSYSTEM HEALTH]; Steward T.A. Pickett et al., *The New Paradigm in Ecology: Implications for Conservation Biology Above*

the need for "ecosystem management" to ensure "sustainability" and "sustainable development" are tied to the shift in perspective.[28] These terms are deceptively succinct. They express an emerging consensus about the implications of scientific information, but they also mask some divergent views on the specific aims and approaches that ought to be adopted.

One author offers the following working definition of the ecosystem management approach: "Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term."[29] This definition usefully highlights three generally-accepted components of an ecosystem management agenda: (1) the goal of sustaining ecosystem integrity over the long term; (2) the use of scientific knowledge in defining and achieving that goal; and (3) the need for new institutional frameworks for making decisions that incorporate value judgments. Before considering the third of these, the issue of organizational change, it is important to address briefly the first two components. Ideas about how scientific knowledge ought to be used in order to sustain ecological integrity necessarily inform the discussion about the adequacy of existing institutions and the need for new approaches to decision-making.

Promoting ecosystem integrity over the long term involves protecting, restoring, and enhancing the overall diversity of life, and maintaining the natural processes that make that diversity

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the Species Level, *in* CONSERVATION BIOLOGY 65-88 (Peggy L. Fiedler and Subodh K. Jain eds. 1992).

28. *See* Grumbine, *supra* note 26, at 34. The first full-length book specifically addressing the need for "ecosystem management" in the United States came out in 1988. J.K. AGEE AND D.R. JOHNSON, ECOSYSTEM MANAGEMENT FOR PARKS AND WILDERNESS (1988). The general notion that sustainable economic development depends upon sustaining ecosystems, and that concerted efforts should be directed toward ecosystem protection is older, however. *See* George Francis, *Ecosystem Management*, 33 NAT. RESOURCES J. 315 (1993). Ideas of ecosystem management have been emerging in the international environment and development literature for some time, gaining acceptance at the United Nations Conference on Environment and Development in 1992. *See infra* part II and Lee P. Breckenridge, *Protection of Biological and Cultural Diversity: Emerging Recognition of Local Community Rights in Ecosystems Under International Environmental Law*, 59 TENN. L. REV. 735, 739-44 (1992).

29. Grumbine, *supra* note 26, at 31. The term "management" is misleading, since one of the underlying themes is that nature cannot be truly controlled. Reed Noss, *Some Principles of Conservation Biology, as They Apply to Environmental Law*, 69 CHI.-KENT L. REV. 893, 904 (1994).

possible.[30] This concept of management is different from notions of natural resources management aimed only at producing particular commodities and amenities.[31] Several key themes distinguish current ecosystem management ideas from earlier approaches.

1. Dealing with Dynamic Nonequilibrium Conditions

An ecosystem management approach recognizes that ecosystems are dynamic and evolving.[32] They cannot be treated as static or wholly predictable, since they are characterized by complex, non-linear processes that maintain forms and functions only through a continuous exchange of energy and materials with the wider environment.[33] Human interventions, therefore, should not seek to fix any particular aspect of the system for perpetuity, since this effort will be fruitless (and probably counterproductive) in achieving long-term ecosystem integrity. Instead, any management approach should seek more broadly to protect the functions and structures of ecosystems that provide resilience in the wake of disruption.[34] People should not seek to halt change or ensure a constant yield of any single product, but rather to foster a long-term dynamic stability by maintaining processes that accommodate and counteract disruptions of the system.[35] The ecosystem management approach does not view

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30. R. Edward Grumbine, in a review of recent literature, found five specific goals that are frequently endorsed as crucial to achieving the broader goal of ecosystem integrity: maintain viable populations of all native species in situ; provide protected areas that represent all native ecosystem types across their natural range of variation; maintain evolutionary and ecological processes such as disturbance regimes, hydrological processes, and nutrient cycles; engage in long-term management to protect evolutionary potential; and accommodate human uses within these constraints. Grumbine, *supra* note 26, at 31. Maintaining ecosystem integrity thus requires human intervention to help counter the destructive effects of past and current disruptions.

31. Norton, *supra* note 27, at 30-31 (comparing resource management for an annual yield of specified products and environmental management aimed at protecting the self-organizing system that sets the context of annual yields); PRIMACK, *supra* note 20, at 5.

32. Judy L. Meyer, *The Dance of Nature: New Concepts in Ecology*, 69 CHI.-KENT L. REV. 875, 875-83 (1994); Tarlock, *supra* note 27, at 1128-30 (discussing DANIEL B. BOTKIN, DISCORDANT HARMONIES: A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY (1990)).

33. Norton, *supra* note 27, at 28.

34. Holly Doremus, *Patching the Ark: Improving Legal Protection of Biological Diversity*, 18 ECOLOGY L.Q. 265, 282-85, (1991) (explaining the ethical and utilitarian reasons for seeking to preserve life processes rather than life forms); Tarlock, *supra* note 27, at 1130.

35. "An ecological system is healthy if it is stable and sustainable—that is, if it is

people as powerless in the face of ecological forces, but neither does it suggest that managers are all-powerful. In essence, it concedes the infeasibility of rigidly controlling natural phenomena, and aims rather to influence outcomes by fostering the self-organizing attributes of ecosystems.[36]

2. Coping with Uncertainty Through Adaptive Management

A conclusion closely related to the recognition of complexity and change is that information will always be insufficient to predict the workings of ecosystems, and outcomes will necessarily be uncertain. Given the context of uncertainty, to achieve meaningful results, ecosystem management must be an adaptive process that treats any action as an experiment.[37] An adaptive management approach views scientific knowledge as subject to modification in a continuous learning process. Careful formulation of hypotheses and goals, monitoring of the effects of activities, and feedback of information in the planning of subsequent steps are essential.[38] The process is never final, and conclusions are always provisional.

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active and maintains its organization and autonomy over time and is resilient to stress." Benjamin D. Haskett et al., *Introduction: What Is Ecosystem Health and Why Should We Worry About It?*, *in* ECOSYSTEM HEALTH, *supra* note 27, at 9. In this formulation, stability does not mean an absence of movement; the apparent lack of change in fact depends upon continuing processes of transformation.

36. Norton, *supra* note 27, at 30.

37. Adaptive management is the term used by C. S. Holling in advocating changes in the way that governments and experts address environmental impacts. C. S. HOLLING, ET AL., ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT 1-21 (C. S. Holling ed., 1978). These ideas of adaptive decision-making have become a central feature in recent thinking about ecosystem management. *See* COMMITTEE ON THE APPLICATIONS OF ECOLOGICAL THEORY TO ENVTL. PROBLEMS, NATIONAL RESEARCH COUNCIL, ECOLOGICAL KNOWLEDGE AND ENVIRONMENTAL PROBLEM-SOLVING 88-92 (1986) [hereinafter ECOLOGICAL KNOWLEDGE] (on approaches to dealing with uncertainty); KAI N. LEE, COMPASS AND GYROSCOPE: INTEGRATING SCIENCE AND POLITICS FOR THE ENVIRONMENT 51-86 (1993) (examining the challenges of adaptive management with particular reference to decisions affecting uses of the Columbia River).

38. In short, this approach requires an ongoing learning process. Daniel A. Farber, *Environmental Protection as a Learning Experience*, 27 LOY. L.A. L. REV. 791 (1994); Grumbine, *supra* note 26, at 31; Tarlock, *supra* note 27, at 1139.

3. Transcending Boundaries

Ecosystem management requires transcending spatial and temporal boundaries and "redrawing the map" according to ecological phenomena. The rejection of preconceived categories stems from the need to trace indirect and remote causes and effects. As one commentator puts it, "grizzly bears don't stop at customs."[39] Not only do organisms and water move across borders, for example, but the locations of watercourses, species, and other structures may also shift across a landscape over time. Ecosystem management thus requires coordinated investigation, analysis, and action across political, administrative, and property lines. The boundary-crossing has a temporal as well as a spatial aspect. Ecosystem management approaches reject too-short time frames as well as too-narrow spatial delineations if they obstruct consideration of long-range consequences.[40]

Ecosystem management does not involve a rejection of all boundary-making. Rather, it demands redrawing spatial boundaries and time frames to suit the particular purposes of the ecological analysis.[41] This task is complicated by the recognition that all ecosystems are globally interrelated while including microscopically small phenomena. Distinct but interconnected systems are seen as complexly nested in a hierarchy of scales.[42] Ecosystem management requires selecting a relevant scale of analysis, without overlooking the interconnections with phenomena at other scales. Typically, a landscape or region-wide approach will be necessary to maintain important large-scale functions.[43] But some goals, such as saving an endangered

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39. George Cameron Coggins, *Grizzly Bears Don't Stop at Customs: A Preface to Transboundary Problems in Natural Resources Law*, 32 KAN. L. REV. 1, 5 (1983)

40. Reed F. Noss, *Issues of Scale in Conservation Biology*, *in* CONSERVATION BIOLOGY, *supra* note 27, at 240-50.

41. ECOLOGICAL KNOWLEDGE, *supra* note 37, at 68-74, 109-110 (on issues of spatial and temporal scale, and implications for establishing study boundaries); Bryan G. Norton, *Ecological Health and Sustainable Resource Management*, *in* ECOLOGICAL ECONOMICS: THE SCIENCE AND MANAGEMENT OF SUSTAINABILITY 102-17 (Robert Costanza ed., 1991) [hereinafter ECOLOGICAL ECONOMICS] (exploring the judgments inherent in defining the "whole" system for purposes of any given endeavor).

42. Noss, *supra* note 40, at 241; Grumbine, *supra* note 26, at 29-30.

43. For example, a high level of biological diversity on a small parcel of land may be achieved by maintaining "edge" habitat, but if such a strategy is pursued throughout a landscape on individual parcels, the area as a whole will be impoverished; it will be lacking the species found only in the interior of large forested areas. In such a situation, therefore,

species peculiar to one location, also require detailed management of a small area,[44] while other aims, such as forestalling changes in climate or weather patterns, might require a consideration of continental or global phenomena.

4. Including People in Nature

An ecosystem management perspective includes the consideration of human beings as integral parts of the ecosystems that they inhabit, use, and alter.[45] Whether human needs are met by deriving food, shelter, and clothing from the immediate environment (in a "subsistence" economy) or by transporting resources to and from distant places through the global economy, an ecosystem management approach logically views human economic transactions to obtain and transform resources and to dispose of wastes as a subset of the broader universe of ecological interactions.[46] The adoption of this perspective has important implications for defining the interface between the biological sciences and economics. The human economy is seen as a subsystem within "nature's economy," and the natural resources of immediate use to people are only part of the "capital" in nature that sustains life overall.[47] An integrated, bioregional approach

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the goal of preserving the full range of characteristic biological communities area requires heterogeneity across the entire landscape. To produce biological diversity on a landscape or regional scale, parcels of land must be managed differently but in an integrated manner. MALCOLM L. HUNTER, JR., WILDLIFE, FORESTS, AND FORESTRY: PRINCIPLES OF MANAGING FORESTS FOR BIOLOGICAL DIVERSITY 80-100 (1990).

44. *Id.* at 235-50.

45. Grumbine, *supra* note 26, at 31.

46. Robert Costanza et al., *Goals, Agenda, and Policy Recommendations for Ecological Economics*, *in* ECOLOGICAL ECONOMICS, *supra* note 41, at 2-4. Ecosystem management puts a new spin on the notion of "resources." While the word typically refers to materials for human use, ecosystem management focuses attention on the "resources" that other species use for food and dwelling as well. *See* Carol M. Rose, *A Tale of Two Rivers*, 91 MICH. L. REV. 1623, 1627 (1993) (book review).

47. The idea that economic growth can only occur within ecological limits has been around for a long time. *See, e.g.*, Kenneth E. Boulding, *The Economics of the Coming Spaceship Earth*, *in* ENVIRONMENTAL QUALITY IN A GROWING ECONOMY (1966), *reprinted in* VALUING THE EARTH: ECONOMICS, ECOLOGY, ETHICS 297-305 (1993) [hereinafter VALUING THE EARTH]; Herman E. Daly, *On Economics as a Life Science*, 76 J. POL. ECON. 392 (1968). But current ecosystem management approaches open up further inquiry into how ecosystems and economic systems can be managed in an integrated fashion to ensure long-run sustainability. *See* Joseph L. Sax, *Property Rights and the Economy of Nature: Understanding Lucas v. South Carolina Coastal Council*, 45 STAN. L. REV. 1433, 1442 (1993) (examining the traditional opposition between the "transformative economy" and the

(as it is sometimes called) seeks affirmatively to accommodate human needs within the broader ecological framework.[48] This task includes ensuring the availability of resources for future human generations, in addition to meeting the needs of the present. Sustainable economic development has become a goal of ecosystem management.[49]

To summarize, the purposes of ecosystem management, to protect ecological integrity and to ensure sustainable development, are intertwined. These aims can only be met by fostering a dynamic resilience in overall systems rather than establishing static conditions or constant yields, by addressing inevitable uncertainty through continuous adaptation, and by using ecologically-based boundaries rather than property or political lines in conducting analysis and planning. These central themes in ecosystem management raise some difficult issues of decision-making authority.

Descriptions of ecosystem management approaches often have the planner's viewpoint; they assume that an expert manager has been put in charge, and the discussion proceeds from that premise. But when ecosystem management goals are advanced for an entire region like the Northern Forest, the reality is quite different. No expert planner or central management authority has been appointed to dictate actions or rules.

Ecosystem management approaches require policy judgments as well as attention to scientific fact-finding. While there is a broad, emerging consensus about the general aims of ecosystem management, and about the characteristics of an ecosystem management approach, there is less agreement about precisely

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"economy of nature," and the need for integrating the two through redefinitions of property rights).

48. WORLD RESOURCES INSTITUTE, *supra* note 24, at 97-100.

49. *See* Costanza, *supra* note 46, at 7-9 (addressing the definition of "sustainable development," distinguishing "development" within ecological limits and "growth" that exceeds them). The World Commission on Environment and Development, established by the United Nations General Assembly, defined sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." WORLD COMM'N ON ENVT. AND DEV., OUR COMMON FUTURE 8 (1987). The definition is often criticized as open to conflicting interpretations. The World Conservation Union ("IUCN") and other organizations emphasize that ecosystems are the framework within which human welfare must be addressed, defining sustainable development as "improving the quality of human life while living within the carrying capacity of supporting ecosystems." THE WORLD CONSERVATION UNION ET AL., *supra* note 24, at 10.

how to achieve these aims in any given location.[50] Implementation of ecosystem management requires judgments about how to value and tradeoff alternative scenarios, and about what to do in the face of uncertainty. There is no single, scientifically-mandated "right way" to answer such questions. Projects to alter or protect a specific set of ecological conditions will inevitably create "winners" and "losers" among organisms and species; if a habitat becomes hospitable to one species, it becomes inhospitable to another.

The issue appears even more starkly when the tradeoffs are among people, or between people and other species. Ecosystem management decisions have distributional implications. The purpose of fostering biological diversity means that different organisms, different sites, and different people will be treated differently, but the overall goal might be met in many different ways. The difficulties of weighing possibilities are compounded because the facts are inevitably uncertain, and any action is an experiment. In this situation, whose preference should count in deciding among competing values? What processes should be followed for determining the values at stake? The form of individual or collective decision-making chosen can significantly affect the configuration and outcome of ecosystem management regimes, as well as the distribution of benefits, broadly defined, among people.

The assertion that ecosystem management goals should be achieved thus opens an inquiry into the adequacy of institutional arrangements for decision-making. As discussed in the next sections, the need for ecosystem management is receiving increasingly widespread acknowledgement, both internationally and nationally, but the creation of institutional frameworks that can resolve policy issues while carrying out a transboundary, adaptive approach remains to be accomplished.

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50. *See* Grumbine, *supra* note 26, at 31-32 (noting differing views on how to integrate economic development with ecosystem protection); U.S. GEN. ACCOUNTING OFFICE, ECOSYSTEM MANAGEMENT: ADDITIONAL ACTIONS NEEDED TO ADEQUATELY TEST A PROMISING APPROACH 57-59 (1994) (noting divergent approaches among different federal agencies).

C. International and National Adoption of Ecosystem Management Goals

In both international and national fora, agencies and representatives of the United States have recognized the need for ecosystem management of forests and other habitats, although the institutional means for bringing about the implementation of this approach, particularly on private lands, remain to be defined.

1. Recent International Commitments to Ecosystem Management

The United Nations Conference on Environment and Development ("UNCED"), held in Rio de Janeiro in 1992, resulted in broad commitments by the United States and other countries to the general goals of ecosystem management, and specific acceptance of an ecosystem perspective on forests. The Rio Declaration on Environment and Development issued at UNCED articulated the twin purposes of protecting ecosystem integrity and ensuring sustainable development; it provides that states shall "cooperate to conserve, protect and restore the health and integrity of the Earth's ecosystem."[51]

Agenda 21, setting forth the action plan to implement the Rio Declaration, expands on the meaning and implications of this ecosystem perspective.[52] In adopting Agenda 21, states have agreed that land must be viewed not simply as a resource subject to human exploitation for the production of commodities, but more broadly as "soils, minerals, water and biota . . . organized in ecosystems which provide a variety of services essential to the maintenance of the integrity of life-support systems and the productive capacity of the environment."[53] Building on this perspective, Agenda 21 endorses the use of "landscape ecological planning" and other ecosystem-based approaches[54] for the purpose of allocating land "to the uses that provide the greatest sustainable benefits."[55] Both Agenda 21 and the

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51. UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT, Annex I at 8, 9, U.N. Doc. No. A/CONF.151/26/Rev. 1 (Vol. I), U.N. Sales No.E.93.I.8 (1993) [hereinafter UNCED REPORT].

52. *Agenda 21*, *in* UNCED REPORT, *supra* note 51, Annex II at 14.

53. *Id.* ¶ 10.1.

54. *Id.* ¶ 10.7(a).

55. *Id.* ¶ 10.5. Agenda 21 asserts that states should reorganize and strengthen their

contemporaneously-adopted Forest Principles[56] specifically call for ecosystem management of forests because of their internationally-significant ecological functions, including their roles in fostering biological diversity, and protecting soil and water resources.[57]

The two conventions that were opened for signature at UNCED likewise establish the need for ecosystem management. The Convention on Biological Diversity[58] affirms states' responsibility to conserve and ensure sustainable use of biological diversity.[59] It requires the parties to manage and regulate biological resources accordingly, both within and outside of designated protected areas, and to promote the protection of ecosystems, habitats, and viable populations of species.[60] The Convention on Climate Change,[61] focusing on the global climatic effects of forests, requires parties to promote sustainable management, conservation, and enhancement of forests, along with other sinks and reservoirs of greenhouse gases.[62]

The Forest Principles and Agenda 21 are not binding instruments, and the Convention on Biological Diversity, though signed by the President, still (as of this writing) awaits

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decision-making structures as necessary to provide an "integrated approach to the planning and management of land resources." *Id.* ¶ 10.2.

56. *Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests, in* UNCED REPORT, *supra* note 51, Annex II at 111 [hereinafter *Forest Principles*]. The Forest Principles are set forth as the "first global consensus on forests." *Id.* Preamble ¶ (d).

57. Governments should take "a rational and holistic approach to the sustainable and environmentally sound development of forests," *Agenda 21*, *supra* note 52, ¶ 11.1, given their numerous ecological roles. *Id.* ¶ 11.10-11.13. The Forest Principles likewise recognize the "vital role" of forests in "maintaining the ecological processes and balance at the local, national, regional and global levels"; this role includes "protecting fragile ecosystems, watersheds and freshwater resources," serving as "rich storehouses of biodiversity and biological resources and sources of genetic material," and carrying out photosynthesis. *Forest Principles*, *supra* note 56, ¶ 4. Since forests involve "complex and unique ecological processes which are the basis for their present and potential capacity to provide resources to satisfy human needs as well as environmental values," *id.* Preamble ¶ (f), they "should be sustainably managed to meet the social, economic, ecological, cultural, and spiritual needs of present and future generations." *Id.* ¶ 2(b).

58. Convention on Biological Diversity, *opened for signature* June 5, 1992, 31 I.L.M. 818 (1992) (entered into force Dec. 29, 1993).

59. *Id.* Preamble, art. 6.

60. *Id.* art. 8.

61. United Nations Framework Convention on Climate Change, *opened for signature* June 4, 1992, 31 I.L.M. 849 (1992) (entered into force Mar. 21, 1994).

62. *Id.* art. 4, ¶ 1(d).

ratification by the Senate. The significance of these agreements for the protection of biodiversity and ecosystem integrity in the United States consequently lies in the expression of adherence to an ecosystem management perspective and the commitment to elaborating additional measures, rather than in the enforceability of specific substantive requirements.[63]

2. Ecosystem Management Policies of U.S. Administrative Agencies

The United States' signatures on the agreements that were reached at UNCED confirmed the growing emphasis on ecosystem management throughout the executive branch, including the administrative agencies charged with environmental protection and natural resources management. The consensus that emerged at UNCED in fact reflected in major ways the positions on ecosystem management that had been developed by U.S. agencies in preparations for the conference. The United States National Report compiled for UNCED emphasized both the need for ecosystem management and the inadequacies of existing domestic programs for implementing such an approach.[64] In the wake of

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63. The two conventions set up procedures for ongoing elaboration of responsibilities and for reporting, monitoring, and financing of activities. Convention on Biological Diversity, *supra* note 58, arts. 23-28; Convention on Climate Change, *supra* note 61, arts. 7-14. Agenda 21 also calls for elaboration of institutional arrangements, and provides that the Commission on Sustainable Development, which reports to the Economic and Social Council of the United Nations, shall have the authority to review the progress that countries make in meeting their Agenda 21 commitments. *Agenda 21*, *supra* note 52, ¶¶ 38.8-38.13. The implementation of Agenda 21 includes implementation of the Rio Declaration and the Forest Principles. *Id.* ¶¶ 1.6 and 11.13(e). While the commitments are "soft," the process of engaging in ongoing fora to elaborate responsibilities could have important long-term effects in bringing about an internalization of emerging international norms in national policies. *See* A. Dan Tarlock, *Local Government Protection of Biodiversity: What Is Its Niche?*, 60 U. CHI. L. REV. 555, 569 n.67 (1993) (discussing implications of international legal developments for biodiversity efforts by municipalities); NICHOLAS A. ROBINSON, ENVIRONMENTAL REGULATION OF REAL PROPERTY A-1 (1994) (referring to Agenda 21 as guiding and reinforcing the environmental regulation of land under domestic law). As in other areas of international environmental law, the building and implementation of an international consensus is closely tied to processes of national lawmaking. Lakshman Guruswamy, *Global Warming: Integrating United States and International Law*, 32 ARIZ. L. REV. 221, 223 (1990).

64. COUNCIL ON ENVTL. QUALITY, UNITED NATIONS CONFERENCE ON ENVIRONMENT & DEVELOPMENT: UNITED STATES OF AMERICA NATIONAL REPORT (1992). Drawing in part on an earlier report of the Science Advisory Board of the U.S. Environmental Protection Agency, the report identified an urgent need for biodiversity protection through ecosystem management, in light of the continued erosion of the nation's biological diversity, but it

UNCED, we find increasing efforts in the federal government to pursue ecosystem management ideas within the constraints of existing statutory authority.

In the United States, the reorientation toward ecosystem management has appeared most prominently in the reformulation of policies at agencies charged with the management of federal lands. Responding to criticism of the fragmentation of federal land management policies along agency lines, and the disregard of ecosystem functions in efforts to produce sustained yields of specific commodities and amenities, federal agencies have begun to rewrite policies and seek coordination across administrative boundaries.[65] The bureaucratic obstacles are significant, and statutory amendments may be needed to bring about more coordinated approaches.[66]

While these efforts have concentrated on overcoming barriers to ecosystem management on federal lands, the issue of how to reach lands held by non-federal entities looms as an even more complex problem.[67] Issues of biological diversity and ecosystem

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also recognized that current laws and institutions are not structured on an ecosystem basis. *Id.* at 293 (citing U.S. ENVTL. PROTECTION AGENCY, REDUCING RISK: SETTING PRIORITIES AND STRATEGIES FOR ENVIRONMENTAL PROTECTION (1990)).

65. Robert B. Keiter, *Beyond the Boundary Line: Constructing a Law of Ecosystem Management*, 65 U. COLO. L. REV. 293, 303-17 (1994) (tracing the emergence of ecosystem management as a legal concept on the public domain); U.S. GEN. ACCOUNTING OFFICE, *supra* note 50 (summarizing efforts to pursue ecosystem management by federal agencies and identifying divergences in approach); STAFF OF HOUSE COMM. ON NATURAL RESOURCES, 103D CONG., 2D SESS., ECOSYSTEM MANAGEMENT: SUSTAINING THE NATION'S NATURAL RESOURCES TRUST (Comm. Print. 1994) (providing recommendations for agency and congressional action to implement ecosystem management); *Definition and Implementation of Ecosystem Management on U.S. Forest Service Lands: Hearing Before the Subcomm. on Agricultural Research, Conservation, Forestry, and General Legislation of the Senate Comm. on Agriculture, Nutrition, and Forestry*, 103d Cong., 1st Sess. (1993) (statements addressing policies of the Forest Service and the Bureau of Land Management, Department of the Interior); THE KEYSTONE CENTER, FINAL CONSENSUS REPORT OF THE KEYSTONE POLICY DIALOGUE ON BIOLOGICAL DIVERSITY ON FEDERAL LANDS 13-16 (1991) (discussing approaches of federal agencies to biological diversity as of 1991). An important attempt to implement ecosystem management across agency boundaries beginning in the 1980's has focused on the Greater Yellowstone Ecosystem. *See* THE GREATER YELLOWSTONE ECOSYSTEM: REDEFINING AMERICA'S WILDERNESS HERITAGE (Robert B. Keiter and Mark S. Boyce eds., 1991); Robert B. Keiter, *Taking Account of the Ecosystem on the Public Domain: Law and Ecology in the Greater Yellowstone Region*, 60 U. COLO. L. REV. 923 (1989).

66. *See* Keiter, *Beyond the Boundary Line*, *supra* note 65, at 325-333; Michael C. Blumm, *Public Choice Theory and the Public Lands: Why "Multiple Use" Failed*, 18 HARV. ENVTL. L. REV. 405, 430 (1994).

67. Commentators have long noted the need to reach privately-owned lands as an integral aspect of successfully managing adjoining federal lands. *See, e.g.*, Robert B.

integrity extend far beyond federal ownership boundaries to areas such as the Northern Forest. The need for the development of ecosystem management approaches for lands throughout the United States has been emphasized in recent federal publications such as the five-year strategy of the Environmental Protection Agency,[68] the environmental report accompanying the National Performance Review,[69] and reports of the Council on Environmental Quality.[70] Nevertheless, despite the repeated endorsement of ecosystem management in recent years at the federal level, hopes for implementation on lands outside federal ownership have faced even more substantial obstacles than those that hinder changes in federal land management practices. The following section examines some of those institutional challenges.

II. THE INSTITUTIONAL CHALLENGES OF AN ECOSYSTEM APPROACH

Despite the talk of a national strategy for ensuring the continuing viability of ecosystems, the statements of general mission remain policy statements and exhortations, not immediately enforceable requirements. This is not to say that the United States lacks rules allocating or guiding the exercise of management authority over natural resources, but rather that the

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Keiter, *On Protecting the National Parks From the External Threats Dilemma*, 20 LAND & WATER L. REV. 355 (1985) (finding that existing environmental and land management statutes are insufficient to protect national parks); Joseph L. Sax, *Helpless Giants: The National Parks and the Regulation of Private Lands*, 75 MICH. L. REV. 239, 241-44 (1976).

68. U.S. ENVTL. PROTECTION AGENCY, THE NEW GENERATION OF ENVIRONMENTAL PROTECTION: EPA'S FIVE-YEAR STRATEGIC PLAN 9-10 (1994). The EPA has resolved to take a more "place-driven" approach in the administration of its programs, and to "act to solve integrated environmental problems through a framework of ecosystem protection." *Id.* at 9. The strategic plan draws on the conclusions reached at an EPA meeting held on Mar. 5, 1994 known as "The Edgewater Consensus." *See* Memorandum from Robert Perciasepe et al. to Carol Browner (Mar. 16, 1994) (on file with the author).

69. OFFICE OF THE VICE PRESIDENT, REINVENTING ENVIRONMENTAL MANAGEMENT, ACCOMPANYING REPORT OF THE NATIONAL PERFORMANCE REVIEW 11-15 (1993) (recommending cross-agency ecosystem planning and management under all federal programs affecting ecosystems).

70. COUNCIL ON ENVTL. QUALITY, INCORPORATING BIODIVERSITY CONSIDERATIONS INTO ENVIRONMENTAL IMPACT ANALYSIS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT 23-4 (1993); COUNCIL ON ENVTL. QUALITY, EXEC. OFFICE OF THE PRESIDENT OF THE U.S., TWENTY-FIRST ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 135-187 (1991) [hereinafter COUNCIL ON ENVTL. QUALITY, TWENTY-FIRST ANNUAL REPORT] (advocating an ecosystem management approach in implementation of the National Environmental Policy Act and other U.S. environmental laws).

impressively complex array of laws governing various aspects of the environment in the United States has nevertheless proved to be insufficient and in many ways opposed to an integrated approach oriented toward the protection of ecosystems.

Before addressing the merits of proposals for institutional change, it is worth considering briefly the nature of the difficulties that an ecosystem management approach poses for existing institutional arrangements, and the possibilities of relying on traditional models of land conservation and environmental protection.

A. The Northern Forest as a "River" of Biodiversity

The institutional failings that became apparent in the Northern Forest are characteristic of partially subtractible public goods and common pool resources.[71] Simply put, the forest is much more like a river than previously imagined. Land has been treated as immobile, readily defined in parcels, and well-suited to allocation among individual owners with full rights of control and alienation through market transactions.[72] In the Northern Forest, the allocation of lands to large private ownerships has in fact served the purpose of fostering the short-term realization of commodity values.[73] However, new ecological understandings have challenged this image of the land, drawing attention to the aspects of the forest that are akin to migratory resources such as fisheries and water. Even though the land itself appears

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71. *See* Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 5-8 (1991) (addressing the characteristics and problems of managing "congestible" resources such as fishing areas). *See also* Vincent Ostrom & Elinor Ostrom, *Public Goods and Public Choices: The Emergence of Public Economies and Industry Structures, in* VINCENT OSTROM, THE MEANING OF AMERICAN FEDERALISM: CONSTITUTING A SELF-GOVERNING SOCIETY 163-97 (1991) (examining the nature of public goods and discussing implications for organization); ELINOR OSTROM ET AL., RULES, GAMES, AND COMMON-POOL RESOURCES 3-20 (1994) (discussing the nature of common pool resource problems).

72. *See* Sax, *supra* note 47, at 1442-1446 (contrasting views of property rights to land in the "transformative economy" and in the "economy of nature").

73. *See* Carol M. Rose, *Property Rights, Regulatory Regimes and the New Takings Jurisprudence—An Evolutionary Approach*, 57 TENN. L. REV. 577, 582-84 (1990) (property regimes as serving national purposes of national wealth and strength). However, harvesting practices providing short-run profits have undermined the comparative advantages of the Northern Forest as a long-term source of commodities. SPENCER R. PHILLIPS, THE WILDERNESS SOCIETY, TOWARD A SUSTAINING FOREST: DEVELOPMENT OPPORTUNITIES FOR THE MAINE WOODS 6-7 (1994).

immobile, definable, and fully allocable to ownerships, the biological processes and the interactions among organisms and their environment that take place on the land are dynamic. These dynamic aspects are not confined to the movements of the highly migratory species usually defined as wildlife and protected through state regulatory programs.[74] Ecological interactions bring about ripples of effects across boundary lines, and even species that do not move as individual organisms will shift as species across a landscape over time, creating an evolving mosaic of patches. The web of ecological interdependencies also means that any event may cause complex repercussions over long periods, imposing detrimental effects on future generations.[75]

The healthy functioning of the ecosystem on any given parcel consequently provides diffuse benefits to others across space and time. A landowner is typically unable to recover for providing such transboundary benefits, because exclusion of beneficiaries is impractical. At the same time, profitable uses of land for timber or real estate development may well have the effect of reducing or eliminating the benefits bestowed on others, both now and in future generations. In these circumstances, the allocation of property rights, though seemingly so complete, is in fact too narrowly-conceived to provide an accounting for the values of biological diversity and the robust functioning of the ecosystem.[76] The result may be a "tragedy of the commons," even though the land is privately owned, since the effect of the unilateral actions carried out under the mantle of ownership is to impose spillover effects on non-owners who collectively depend upon maintenance of a biologically diverse ecosystem.[77]

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74. Current ecological thinking consequently would extend the term "wildlife" to include all organisms in a forest, including plants, rather than limiting the idea to the more obviously mobile and "unowned" animals such as deer and geese.

75. *See* Richard J. Lazarus, *Debunking Environmental Feudalism: Promoting the Individual Through the Collective Pursuit of Environmental Quality*, 77 IOWA L. REV. 1739, 1762 (1992) (discussing the intertemporal aspects of common pool problems); Daniel A. Farber & Paul A. Hemmersbaugh, *The Shadow of the Future: Discount Rates, Later Generations, and the Environment*, 46 VAND. L. REV. 267, 289-300 (1993) (addressing issues of equity among generations); EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY 47 (1989); Edith Brown Weiss, *The Planetary Trust: Conservation and Intergenerational Equity*, 11 ECOLOGY L.Q. 495, 498 (1984).

76. *See* Rose, *supra* note 46, at 1627 (analyzing why such situations present problems of "not enough" property rather than "too much" property).

77. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968). *See also* ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR

Like a river, a forest ecosystem is of far greater value if maintained as a whole, complexly-functioning entity (or, as the business-minded put it, as a "going concern") rather than separated into components and dedicated to production of particular commodities through monocultural practices or parcelization.[78] Yet the legal system, through definitions of power suited to maximizing the production of commodities and the realization of values through markets, does not include non-commodity ecosystem values in the calculus carried out through the economy.

Commentators have pointed, therefore, to the need for redefining or limiting property rights in order to place them within a broader context of ecological considerations.[79] This perspective on land-based resources conjures up explicit parallels to the evolution of water law, particularly in the western states where the recognition of important instream flow values (including the values of viable aquatic ecosystems) has led to backpedaling from earlier recognitions of sweeping private authority to remove water from waterways and engage freely in water transfers.[80] As in a river, the allocation of rights to

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COLLECTIVE ACTION 1-28 (1990) (examining Hardin's model and other formulations of the problems of collective action).

78. *See* Richard A. Epstein, *Why Restrain Alienation?*, 85 COLUM. L. REV. 970, 978-982 (1985) (analogizing the management of a river as a common pool resource to efforts to preserve the value of a business as a "going concern" in bankruptcy situations); Carol M. Rose, *Energy and Efficiency in the Realignment of Common-Law Water Rights*, 19 J. LEGAL STUD. 261, 291-92 (1990) [hereinafter Rose, *Energy and Efficiency*] (analogizing a river to a library book that has a greater value when kept intact rather than divided among individuals). *See also* Carol M. Rose, *Given-ness and Gift: Property and the Quest for Environmental Ethics*, 24 ENVTL. L. 1, 5-6 (1994) [hereinafter Rose, *Given-ness and Gift*] (discussing the problems of attempting to compartmentalize environmental resources that need to be managed as wholes.)

79. Sax, *supra* note 47; Joseph L. Sax, *Ecosystems and Property Rights in Greater Yellowstone: The Legal System in Transition*, *in* THE GREATER YELLOWSTONE ECOSYSTEM: REDEFINING AMERICA'S WILDERNESS HERITAGE, *supra* note 65, at 77; Richard J. Lazarus, *Shifting Paradigms of Tort and Property in the Transformation of Natural Resources Law*, *in* NATURAL RESOURCES POLICY AND LAW: TRENDS AND DIRECTIONS 193-215 (Lawrence J. MacDonnell and Sarah F. Bates eds., 1993); J. Peter Byrne, *Green Property*, 7 CONST. COMM. COMMENTARY 239 (1990).

80. Rose, *Energy and Efficiency*, *supra* note 78, at 293-94. *See also* Eric T. Freyfogle, *Context and Accommodation in Modern Property Law*, 41 STAN. L. REV. 1529 (1989); Lynda L. Butler, *Environmental Water Rights: An Evolving Concept of Public Property*, 9 VA. ENVTL. L.J. 323 (1990). The redefinition of rights to resources can raise constitutional issues involving the scope of government authority and the issues involving the scope of government authority and the protection of private property from uncompensated takings. This article, however, does not pursue the constitutional questions that arise when a

exploitation and alienation of land-based resources needs to provide for adjusting individual actions in coordination with those of others, taking changing circumstances into account, so that the collective uses mesh with the functioning of the ecosystem. These arguments correlate with the assertion that the economy is properly viewed as only a subset of "nature's economy."

B. The Possibilities for a Centrally-Formulated Solution

How might the ecological contextualization of rights to exploit land-based resources be achieved? Standard answers to the problems of unsustainable exploitation of shared resources are "top-down" solutions. These answers depend upon the exercise of centralized government authority to design and enforce compliance with the system, but vary in the extent to which they allow or rely upon decentralized, market-based decision-making by nongovernmental actors in day-to-day implementation. Government ownership, command-and-control regulation, and market-based incentives are three such approaches that are characteristic of national environmental programs in the United States. As discussed below, however, none of these models appears to offer a straightforward scheme for moving ahead to the far more expansive, adaptive coordination that ecosystem management would require. Maintaining entire ecosystems and protecting all forms of biological diversity are tasks that test the limits of an already-overloaded legal system.

1. Government Ownership

Government acquisition and management of land has long stood as a central approach to the preservation of nature. New York's Adirondack Forest Preserve, itself a part of the Northern Forest, is a well-known example of an ambitious effort by state government to set aside land under a "forever wild" designation.[81] But while conservationists continue to press for

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government or property owner asserts exclusive authority that trumps the claimed authority of others. It focuses rather on the specific structural problems of accommodating multiple overlapping sources of authority in those situations where private property rights as well as federal and state government powers of regulation and eminent domain are all conceded to exist. *See infra* notes 87, 89 and 116.

81. Louise A. Halper, *A Rich Man's Paradise: Constitutional Preservation of New York State's Adirondack Forest, a Centenary Consideration*, 19 ECOLOGY L.Q. 193 (1992).

large-scale government acquisitions, the lessons of conservation biology suggest the fruitlessness of relying solely on government ownership to provide an overarching institutional framework for an ecosystem management approach.[82] The images of the "citadel park" or the "ark" of biological diversity were based on a now-bygone optimism that nature could be saved simply by setting up islands in the landscape.[83]

As the federal government experience in the western United States shows, even vast government ownership is inadequate in its scope to address ecosystem functions, as in the area surrounding Yellowstone National Park.[84] In the Northern Forest and other areas predominantly in private ownership, the costliness and political impossibility of dispossessing current owners on a large scale mean that government ownership can offer at best only pieces of an answer to the need for ecosystem management. The Northern Forest Lands Council explicitly rejected proposals for large-scale acquisition of nature preserves,[85] and environmental advocates, while pressing for a more ambitious program of government purchases,[86] likewise acknowledge that government ownership alone cannot offer more than components of a larger solution.

At the heart of the rejection of government ownership as the road to the salvation of the Northern Forest lies the fundamental view that people too must live within ecosystems, and that ecosystem management, while encompassing human activities, must also foster economic endeavors and individual autonomy. Tightly centralized, unitary control might appear to offer the best hope for the adaptive, experimental, scientifically rigorous approach that is needed for protection of biological diversity. But even if government acquisition of the Northern Forest were

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82. *See* NATIONAL RESEARCH COUNCIL, SETTING PRIORITIES FOR LAND CONSERVATION 48-49 (1993).

83. William H. Rodgers, *Adaptation of Environmental Law to the Ecologists' Discovery of Disequilibria*, 69 CHI.-KENT L. REV. 887, 888-90 (1994).

84. THE GREATER YELLOWSTONE ECOSYSTEM, *supra* note 65, at 3-4.

85. COMMON GROUND, *supra* note 9, at 52 ("The Council believes that full fee public acquisition is generally not an appropriate mechanism for maintaining the extensive working forest component across the broad landscape of the Northern Forest.").

86. *E.g.*, THE ADIRONDACK COUNCIL ET AL., A 1994 NEW YEAR'S RESOLUTION FOR THE NORTHERN FOREST (Northeast Regional Office, National Audubon Soc'y ed., 1994) (recommendations for land protection projects by twenty-two environmental organizations); Tom Lepisto, *Vision Becomes Action*, APPALACHIA, Sept. 1991, at 8, 15 (describing support by some environmental groups for large-scale public acquisition in the Northern Forest).

financially and politically conceivable, it would not offer a ready means for integrating an array of human activity with other ecosystem functions.[87] Whatever institutional form ecosystem management might take, it cannot be a dictatorship or monopoly that excludes the complexities of human participation that "sustainable development" necessarily includes.

2. Command and Control Regulation

A federal regulatory program, establishing an administrative bureaucracy to control specific activities through rule-making while otherwise allowing autonomous decision-making by private owners, might seem to offer the obvious means for achieving ecosystem management in a region such as the Northern Forest. Such an administrative regime, implemented through an expanded federal bureaucracy, with the possible assistance of the states, would match the planning and optimization rhetoric of ecosystem management proposals.

The already far-reaching environmental programs that the United States has developed since the 1970's have predominantly taken this form. These existing laws serve to protect the environment from specific impacts, and many of them might be administratively adapted or legislatively extended.[88] Certainly the Commerce Clause provides congressional authority that is sufficiently sweeping to support ecosystem-wide regulation without compensation to owners, as long as it is not so onerous as to work a constitutional taking of property.[89]

Nevertheless, even proponents of legislative and administrative action acknowledge the difficulties of bringing about ecosystem management by a centralized regulatory mandate.[90] Existing regulatory programs do not add up to an

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87. To the extent that government held lands are opened to private development, the issues become more like those of regulating private activity discussed in the next section. The process of opening public lands to private uses is the reverse of the assertion of public interests in private lands addressed here, but it raises many of the same questions of the accommodation between centralized management and the need for decentralized economic activity. *See* Marla E. Mansfield, *On The Cusp of Property Rights: Lessons from Public Land Law*, 18 ECOLOGY L. Q. 43 (1991); Marla Mansfield, *When "Private" Rights Meet "Public" Rights: The Problems of Labeling and Regulatory Takings*, 65 U. COLO. L. REV. 193 (1994).

88. Tarlock, *supra* note 63, at 569-74.

89. Doremus, *supra* note 34, at 292-94.

90. *Id.* at 324.

ecosystem management regime, and a broad extension of administrative power would face difficult obstacles.

The piecemeal approach to ecosystems under existing law may be illustrated with a few examples. Even the statutes that go beyond setting uniform national requirements in order to address site-specific conditions do not provide for the sort of decision making that can ensure ecosystem integrity. The Endangered Species Act, the centerpiece of the nation's statutory efforts to protect biological diversity, provides a powerful basis for habitat-oriented conservation measures, but only for specific species that have already dwindled in number.[91] Important parts of the act apply only in connection with federal actions such as permit issuance or funding.[92] The National Environmental Policy Act offers a framework that can be used for investigating ecosystem-wide repercussions of projects, but only in connection with federal actions, and it imposes no substantive requirement to ensure ecosystem integrity.[93] The Clean Water Act aims to restore the health of aquatic ecosystems, but its provisions are limited to waters and wetlands within the jurisdictional scope of the statute.[94] Many other statutes at the federal level, as well as laws at the state and municipal levels, limit pollution, control development, or subsidize beneficial endeavors.[95] Yet, as

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91. Endangered Species Act, 16 U.S.C. §§ 1531-1543 (1988). The potential scope of the statute has been systematically narrowed through administrative interpretation, as Oliver Houck has shown in a detailed review of the implementation of the act. Oliver A. Houck, *The Endangered Species Act and its Implementation by the U.S. Department of Interior and Commerce*, 64 U. COLO L. REV. 277, 278, 358 (1993); *See also* Doremus, *supra* note 34, at 306-10; Alyson C. Flournoy, *Coping with Complexity*, 27 LOY. L.A. L. REV. 809, 813-15 (1994) (on the lack of an ecosystem approach in the Endangered Species Act).

92. *Id.* § 1536.

93. National Environmental Policy Act, 42 U.S.C. § 4321c (1988). *See* Doremus, *supra* note 34, at 326.

94. Federal Water Pollution Control Act of 1977 (as amended), 33 U.S.C. §§ 1251-1387 (1988) [hereinafter Clean Water Act]. *See also* Curtis C. Bohlen, *Wetlands Politics From a Landscape Perspective*, 4 MD. J. CONTEMP. LEG. ISSUES 1 (1993) (on the problems and possibilities of achieving a landscape perspective in the protection of wetlands under the Clean Water Act).

95. *See, e.g.*, Robert L. Fischman, *Biological Diversity and Environmental Protection: Authorities to Reduce Risk*, 22 ENVTL. L. 435 (1992) (noting availability of authority under numerous federal statutes to address aspects of problems affecting biological diversity); Tarlock, *supra* note 63 (regarding sources of local authority to protect biological diversity); Jeffrey L. Amestoy & Mark J. Di Stefano, *Wildlife Habitat Protection Through State-wide Land Use Regulation*, 14 HARV. ENVTL. L. REV. 45 (1990); James H. Wickersham, Note, *The Quiet Revolution Continues: The Emerging New Model for State Growth Management Statutes*, 18 HARV. ENVTL. L. REV. 489 (1994). Numerous state and federal programs

experience in the Northern Forest shows, together they do not provide a system for preventing cumulatively unsustainable uses or adaptively pursuing ecosystem-wide biological diversity.

Could the nation's environmental statutes nevertheless be retooled according to an ecosystem perspective? The prospects for a comprehensive ecosystem management program implemented directly through national regulations are dim, for several major reasons. First, the current media-specific focus of statutes results in bureaucratic boundaries among programs and limits the scope of analysis;[96] the "territorial myopia" to which Mollie Beattie refers is reinforced by statutory mandates.[97] But the possibilities for abolishing these divisions in the context of a single, integrated, ecosystem-oriented, command-and-control regulatory system are remote. One difficulty is that these programs are built upon an attempt at "comprehensive rationality" that depends upon ascertaining all relevant facts and interests in advance, and then reaching a single, definitive conclusion.[98] The great difficulties of attempting such comprehensive analysis are already apparent in the much narrower context of media-specific programs, and they could only be compounded by an attempt to reach encompassing solutions for all aspects of ecosystems.[99] Indeed, while conservation biology advocates a holistic and rational perspective, it rejects the

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provide a basis for land conservation activities in the Northern Forest. *See* NFLS, *supra* note 1, at 121-39; Northern Forest Lands Council, *A Summary of State Land Conservation Activities for the States of Maine, New Hampshire, New York, and Vermont*, *in* TECHNICAL APPENDIX, *supra* note 2, § 9.

96. The difficulties of integrating media-specific programs have been a topic of considerable discussion. *See, e.g.*, Symposium, *Integrated Pollution Control*, 22 ENVTL. L. 1 (1992); INTEGRATED POLLUTION CONTROL IN EUROPE AND NORTH AMERICA (Nigel Haigh & Frances Irwin eds., 1990); Lakshman Guruswamy, *Integrating Thoughtways: Re-Opening of the Environmental Mind?*, 1989 WIS. L. REV. 463 (1989); BARRY RABE, FRAGMENTATION AND INTEGRATION IN STATE ENVIRONMENTAL MANAGEMENT (1986).

97. Beattie, *supra* note 11.

98. James E. Krier and Mark Brownstein, *On Integrated Pollution Control*, 22 ENVTL. L. 119 (1992) (discussing the "synoptic" model of decision-making); Colin Diver, *Policy-making Paradigms in Administrative Law*, 95 HARV. L. REV. 393, 409-21 (1981); Charles E. Lindblim, *The Science of Muddling Through*, 19 PUB. ADMIN. REV. 79, 81 (1959) (contrasting the "rational-comprehensive" method with the method of "successive limited comparisons"); *See also* Alyson C. Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decisionmaking*, 15 HARV. ENV. L. REV. 327, 333-38 (1991) (discussing the problems of requiring definitive and final determinations of risk in protective environmental decisionmaking).

99. E. Donald Elliott, *Environmental Law at a Crossroad*, 20 N. KY. L. REV. 1, 5-10 (1992).

possibility of knowing all the facts in advance. In this sense, its demand for an adaptive learning process is not in tune with the premises of these regulatory programs.[100]

Second, command-and-control regulatory systems have long been criticized as inflexible, costly, and insensitive to local conditions,[101] even as they have been defended for taking the most workable approach available in the circumstances.[102] A regulatory system based wholly on centrally-formulated directives will likely have difficulty developing and adjusting ecosystem management requirements in a regionally-specific way that is both politically viable and ecologically satisfactory.

Finally, national environmental regulatory programs, as currently structured, are prone to administrative gridlock. The very safeguards that protect the regulatory agencies from "capture" by powerful interest groups contribute to stalemate and inaction.[103] Statutory mandates have remained unimplemented as agencies have faced overwhelming political pressures, public distrust, and factual uncertainties.[104] The difficulties that already plague the national environmental programs would be accentuated in a larger regulatory endeavor aimed at ecosystem management.[105] If the Environmental Protection Agency has

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100. *See* Flournoy, *supra* note 91 (on the need for new decision-making tools to deal with environmental problems characterized by uncertainty and complexity). *See also* Richard O. Brooks, *A New Agenda for Modern Environmental Law*, 6 J. ENVTL. L. & LITIG. 1 (1991) (addressing the failings of a "social engineering approach" to environmental problems, and calling for new forms of collective decisionmaking).

101. *See* Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1334-40 (1985).

102. Howard Latin, *Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms*, 37 STAN L. REV. 1267, 1270-73, 1331-32 (1985).

103. *See* Richard J. Lazarus, *The Tragedy of Distrust in the Implementation of Federal Environmental Law*, 54 J.L. & CONTEMP. PROBS. 311 (1991).

104. *See* Richard B. Stewart, *Madison's Nightmare*, 57 U. CHI. L. REV. 335, 340-48 (1990) (problems of faction in modern administrative proceedings).

105. *See* Rose, *Given-ness and Gift*, *supra* note 78, at 8-9. If regulatory decisionmaking were left to the broad discretion of a single agency, without the elaborate safeguards typical of EPA programs, the dangers of dominance by powerful economic interests would be even greater. The experience with programs to grant leases or licenses for private activity on federally-owned lands suggests the difficulty of withstanding demands for short-term private economic gain for the sake of ecosystem protection even when the government holds title. Blumm, *supra* note 66, at 414 (discussing results of "wholesale delegation of authority to land managers to act in the public interest"). The possibilities of bias toward commodity users are at least as substantial when the government exercises mere regulatory authority over privately-owned property. *See*

failed to promulgate more than a few welfare-based ambient air quality standards under the Clean Air Act over the last two decades, for example,[106] one can imagine what difficulties it would have prescribing comprehensive, national, ecological requirements sufficient to ensure the overall maintenance of ecosystems.[107]

3. Markets

Market-based systems have been a widely-touted alternative to centralized government regulation or ownership.[108] Some proposals substitute fees or conditional subsidies for administrative directives as the means of inducing specific behavior. Systems that entail the creation of tradable property rights or permits even more radically decentralize day-to-day decision-making about resources.[109] The government exercises a powerful role in such a system, but its authority is asserted in the definition and allocation of rights, and in the operations of the market framework.[110] In some circumstances, tradable permit systems can provide workable means for shifting development to specific locations in a landscape without taking over private decision-making about the advisability or form of the projects.[111] The characteristics of market-based systems are attractive from

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Clayton P. Gillette & James E. Krier, *Risks, Courts, and Agencies*, 138 U. PA. L. REV. 1027, 1064-70 (1990) (discussing possibilities of bias if powerful groups gain asymmetric access to agencies addressing "public risks").

106. 42 U.S.C. §§ 7401-7671q (1988); 40 C.F.R. pt. 50 (1994).

107. *See* Rose, *supra* note 46, at 1634-35 (observing that centralized zoning is unlikely to provide a workable coordinating mechanism for managing the Amazonian rainforest).

108. *E.g.* Ackerman & Stewart, *supra* note 101, at 1341-51; Bruce A. Ackerman and Richard B. Stewart, *Reforming Environmental Law: The Democratic Case for Market Incentives*, 13 COLUM J. ENV. L. 171, 178-88 (1988); Robert Hahn & Robert Stavins, *Incentive-Based Environmental Regulation: A New Era from An Old Idea?*, 18 ECOLOGY L.Q. 1, 7-12 (1991).

109. *See* Robert Hahn & Gordon Hester, *Marketable Permits: Lessons From Theory and Practice*, 16 ECOLOGY L.Q. 361, 368-73 (1989) (describing specific types of programs).

110. *See* James E. Krier, *The Tragedy of the Commons, Part Two*, 15 HARV. J.L. & PUB. POL'Y 325, 341-44 (1992) (observing that market-based systems depend upon active government intervention, and are subject to many of the failures of regulatory programs).

111. *See* James T. B. Tripp & Daniel J. Dudek, *Institutional Guidelines for Designing Successful Transferable Rights Programs*, 6 YALE J. REG. 369, 372-73 (1989); Jerold S. Kayden, *Market-Based Regulatory Approaches: A Comparative Discussion of Environmental and Land Use Techniques in the United States*, 19 B.C. ENVTL. AFF. L. REV. 565, 574-79 (1991).

an ecosystem management perspective. Markets allow for dynamic interactions to revise resource allocations based on changes in values and needs, and they provide for system wide adjustments over time through feedback of information.

Nevertheless, markets provide no easy comprehensive solution. They depend entirely on the accurate and complete formulation and allocation of measurable, exclusive, and enforceable rights to fungible goods representing the relevant values. This is a task that the government is generally unable to carry out in a way that would aid decision-making about biological diversity and ecosystem functions. The difficulties lie both in the lack of information sufficient to establish all final goals as measurable quantities, and in the inability to structure markets where biological resources are tied to each other in complex, site-specific relationships.[112]

Establishing market systems demands the same sort of comprehensive rationality as the more conventional regulatory programs by requiring an advance investigation of relevant facts and interests sufficient to establish a definitive target level of resource exploitation.[113] Conservation biology rejects the comprehensive rationality that such schemes presuppose; or, more precisely, it asserts that the fixed goals and framework of a market would need to rest upon a set of temporary conclusions that must themselves be subject to testing and change within some larger decision making framework.[114] The ongoing uncertainties about what functions are of ecological value, and what forms and level of exploitation are acceptable, mean that an ecosystem perspective necessarily treats any market framework as contingent and limited to specific goods that can be commodified.[115] They may be a useful tool for accomplishing

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112. *See* Rose, *supra* note 71, at 21-23.

113. *See supra* notes 95-97 and accompanying text.

114. *See* Norton, *supra* note 27, at 29-31 (discussing the implications of a "hierarchy of scales" for the validity of the reductionistic, economic criteria of resource management systems).

115. Rose, *Energy and Efficiency*, *supra* note 78, at 293-96 (noting that tradable entitlements programs may provide a useful means of coordinating consumptive uses, once the allowable consumption has been determined, but other management regimes are needed for addressing the "instream" values of public-good resources); OSTROM *supra* note 77, at 30-32 (distinguishing the resource units, which are subject to appropriation, from the resource system that supplies them).

specific goals within a larger ecosystem management framework, but they can offer only a small part of the institutional picture.

This brief sketch of standard institutional approaches to environmental management is offered to highlight both the existence of numerous institutional mechanisms adopting a spectrum of legal tools, and the lack of any single overarching scheme to provide a ready framework for accomplishing a more far-sighted, adaptive, ecosystem-oriented approach. From an ecosystem perspective, the legal landscape is densely populated with institutional systems, each operating in a short-sighted, piecemeal, uncoordinated way that fails to take the overall functioning of ecosystems into account. Federal, state, and local agencies, corporations, and individual owners autonomously exercise their separate prerogatives of sovereignty and ownership without adequate ecological coordination.[116]

Although an ecosystem management perspective offers criticism of institutional fragmentation and unilateral local actions, and urges a holistic view, there are nevertheless nuances and tensions in the attitudes that it adopts toward centralization. As this review of three broad categories of centralized decision-making suggests, an ecosystem management approach expresses deep skepticism about the possibilities of omniscient, monolithic, centralized planning even as it makes sweeping demands for coordination and reciprocity. The complexities of this attitude toward centralized answers can be illuminated by examining, on the reverse, the equally complex view that an ecosystem perspective takes toward the autonomy of local communities and smaller-scale organizations in general.

C. Localism and Ecosystem Management

1. Tradition and Culture in the Northern Forest

In the Northern Forest proceedings, the discussions about how to deal with environmental and economic problems included repeated statements of commitment to the traditions, heritage, customs, culture, stability, and land ownership and use patterns of the region. The Senators who sponsored the legislation for the

116. *See* Errol Meidinger, *The Changing Legal Environment of Northern Forest Policy Making*, *in* SUSTAINING ECOSYSTEMS, *supra*, note 11, at 125 (addressing legal origins of the fragmentation of control, and discussing the resulting obstacles to ecosystem management).

Northern Forest Lands Study admonished the Forest Service that they were seeking "reinforcement rather than replacement of the patterns of ownership and use. . . ."[117] The Governors' Task Force, in its report, asserted its concern with maintaining the "special character of the region," and achieving change "consistent with the region's culture and heritage."[118] Similarly, the mission of the Northern Forest Lands Council has been to "reinforce the traditional patterns of land ownership and uses . . . which have characterized these lands for decades"; this endeavor includes "the promotion of economic stability."[119] Environmental groups with an interest in the management of the forest have joined in the rhetoric of tradition and community culture. The Appalachian Mountain Club, for example, has sought openly to ally itself with local communities, praising Northern Forest traditions in its publications.[120]

These statements all recognize the extent to which the regional economy as well as the sense of a regional identity depend upon the forests, and they express respect for, and even deference to, local decision-making. But just how compatible is a respect for the autonomy of local groups and organizations with ecosystem management goals? The rhetoric of tradition and culture is not always affiliated with a concern for ecosystem protection, and the protection of biological diversity does not always coincide with economic stability, as recent episodes in the saga of federal land management policy have so clearly shown.[121] On federal lands, efforts to ensure a sustainable yield

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117. NFLS, *supra* note 1, at 90. The Forest Service's assignment included assessing the potential impacts of ownership and management changes on "traditional land use patterns, including economic stability and employment," and identifying "strategies to protect the long-term integrity and traditional uses" of forest land. *Id.* at v, 89.

118. GOVERNORS' TASK FORCE ON NORTHERN FOREST LANDS, *supra* note 8, at 1.

119. NORTHERN FOREST LANDS COUNCIL, THE DRAFT RECOMMENDATIONS OF THE NORTHERN FOREST LANDS COUNCIL (1994) (Mission Statement and Operating Principles).

120. *E.g.* Catherine K. Buni, *The Northern Forest: A Special Report*, APPALACHIA, Sept. 1991, at 1 (AMC and other organizations seek "to ensure the continuance of the Northern Forest's traditions"); Preston H. Saunders & Andrew J. Falender, *Carpe Diem*, AMC OUTDOORS, Sept. 1993, at 1 (AMC recommends measures to "perpetuate the sense of place and tradition that is important to residents and visitors alike"). *See also* ADIRONDACK COUNCIL, ET AL., THE NORTHERN FOREST: A LEGACY FOR THE NEXT GENERATION 2 (1994) (recommendations of 21 environmental organizations following issuance of the Northern Forest Lands Council draft report: "We must respect and build upon the history and culture of the Northern Forest and the connections between people and the land.").

121. The controversy over protection of the habitat of the northern spotted owl is a well-known example of such conflicts. *E.g.* Alyson C. Flournoy, *Beyond the "Spotted Owl*

of timber for the sake of "community stability" have been a recipe for expanding timber cuts at the expense of fish and wildlife habitat.[122] "Custom and culture" ordinances have embodied hostile local opposition to national measures aimed at protecting biological diversity and ecosystem functions.[123] Taking a cue from the "wise use" and property rights movements in the West,[124] property rights activists in the Northern Forest, have fought government intervention by invoking a tradition of local autonomy.[125] These positions are far different from those of other participants in the Northern Forest proceedings who speak of the local way of life while asserting that the United States, state governments, or environmental groups with largely urban memberships should exert influence in regional decision-making.[126]

The prominence of the rhetoric of tradition and culture in the events of the Northern Forest proceedings does not reflect any

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Problem": Learning from the Old-Growth Controversy, 17 HARV. ENVTL. L. REV. 261 (1993); Michael C. Blumm, *Ancient Forests, Spotted Owls, and Modern Public Land Law*, 18 B.C. ENVTL. AFF. L. REV. 605 (1991). *See also* Alison Rieser, *Ecological Preservation as a Public Property Right: An Emerging Doctrine in Search of a Theory*, 15 HARV. ENVTL. L. REV. 393, 410 (noting potential conflict between broad public interests in ecosystem protection and local demands for access to resources); James E. Krier, *The Political Economy of Barry Commoner*, 20 ENVTL. L. 11, 32-33 (1990) (critiquing Commoner's proposals for local control of economic and environmental decisions); Zygmunt J.B. Plater, *Keynote Essay: A Modern Political Tribalism in Natural Resources Management*, 11 PUB. LAND L. REV. 1 (1990). Moreover, even if fostering cultural diversity is viewed as an important part of managing ecosystems, it is not at all clear that deference to local autonomy and decentralized decision-making will always achieve this purpose. *See* Joseph L. Sax, *Do Communities Have Rights? The National Parks as a Laboratory of New Ideas*, 45 U. PITT. L. REV. 499, 503 (1984) (observing that if federal lands were turned over to states and private owners, we would likely get less diversity rather than more, as a result of commercial activity, "losing those things that we usually associate with 'community': [d]istinctiveness, stability, a strong association of the people with the landscape, maintenance of traditions, and historical structures").

122. Blumm, *supra* note 66, at 422 ("A theory that assumes organized local interests are a surrogate for the national public interest is a recipe for imbalance."). *See also*, Con H. Schallau & Richard M. Alston, *The Commitment to Community Stability*, 17 ENVTL. L. 429 (1987) (tracing the history of the community stability concept in federal land management policies).

123. Keiter, *supra* note 65, at 322.

124. *Id.* at 321-23.

125. *E.g.*, Thomas J. Morse, Vermont Property Rights Center, *Rebuttal of Northern Forest Land Committee: Findings and Options from a Property Rights Perspective*, *in* TECHNICAL APPENDIX, *supra* note 1, § 9; NFLS, *supra* note 1, at 98-99 (questionnaire distributed by the National Inholders Association).

126. *See, e.g.* ADIRONDACK COUNCIL ET AL., *supra* note 14 (summarizing the range of views expressed at the Northern Forest Lands Council's "listening sessions").

easy consensus about how to structure solutions, but it does highlight the extent to which the inner workings and characteristics of groups have become an issue in the discussions about ecosystem management and about the need for centralized control.

2. Local Self-Organization as Social Capital

An advocate of ecosystem management, considering whether local autonomy and a distinctive, local culture are good things, would likely respond, "it depends." Specifically, it depends on whether the local community has developed, or seems capable of developing, effective decision-making processes that coincide with ecosystem management goals. This scrutiny of the local group extends beyond formal, local, legal requirements[127] to include the informal norms, shared preferences, and ordinary practices that make up the traditions and culture of the community and that affect the way in which the ecosystem is protected and used.[128]

That some groups are more adept and sophisticated at sustainably managing aspects of their local environment than a centralized bureaucracy would be, while other groups are worse,

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127. *See generally* Tarlock, *supra* note 63 (discussing sources of local authority for the protection of biological diversity).

128. *See* ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991) (examining the ways in which informal norms govern interactions in a close-knit group, sometimes contrary to formal legal requirements, and hypothesizing that they serve to maximize the aggregate welfare of group members); Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315 (exploring evolution of property rights in land in close-knit communities). "[C]ustomary land rules are not a shapeless jumble, but instead form an unauthored strategy that cleverly allocates a prized resource with confoundingly complex attributes." *Id.* at 1319. Local institutions may act primarily as "the guardians of the ancient constitution, in the sense of a web of community understandings—sometimes highly idiosyncratic—about the way things ought to be done." Carol M. Rose, *The Ancient Constitution vs. the Federalist Empire: Anti-Federalism from the Attack on "Monarchism" to Modern Localism*, 84 NW. U. L. REV. 74, 95 (1989) [hereinafter *The Ancient Constitution*]. Customary practices may therefore amount to a complex property regime for coordinating the management of resources to meet community and private needs. *See* Carol M. Rose, The Comedy of the Commons: Custom, Commerce, and Inherently Public Property, 53 U. CHI. L. REV. 711, 739-49 (discussing the role of custom in the management of common resources); Peter S. Menell, *Institutional Fantasylands: From Scientific Management to Free Market Environmentalism*, 15 HARV. J.L. & PUB. POL'Y 489, 497-99 (1992) (addressing norms as non-market systems for allocating resources); OSTROM ET AL., *supra* note 71, at 45 ("[N]orms of behavior become a form of social capital that can be drawn on repeatedly as the foundation for cooperative solutions to CPR [common-pool resource] dilemmas.").

is an observation supported by an expanding literature in the social sciences and in conservation biology.[129] Some local communities are remarkably successful in sustainably managing entire landscapes through complex rules and practices that are tailored to the particular ecosystem and to seasonal or other periodic changes.[130] It appears that distinctive forms of local organization may in certain circumstances greatly contribute to biological diversity, in a way that uniform central regulations cannot.[131]

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129. Particular attention has focused on the successes and failures of communities with communal property institutions in sustainably using ecosystems while protecting biological diversity. *E.g.* OSTROM, *supra* note 77, at 58-102 (1990); COMMON PROPERTY RESOURCES: ECOLOGY AND COMMUNITY-BASED SUSTAINABLE DEVELOPMENT (Firket Berkes ed., 1989); THE QUESTION OF THE COMMONS: THE CULTURE AND ECOLOGY OF COMMUNAL RESOURCES (B.J. McCay & J.M. Acheson eds., 1987). Other relevant literature treating local institutions as social capital deals specifically with infrastructure development such as irrigation systems, public water supplies, and roads. *E.g.* ELINOR OSTROM, ET AL., INSTITUTIONAL INCENTIVES AND SUSTAINABLE DEVELOPMENT: INFRASTRUCTURE POLICIES IN PERSPECTIVE (1993); ELINOR OSTROM, CRAFTING INSTITUTIONS FOR SELF-GOVERNING IRRIGATION SYSTEMS (1992). The similarities between infrastructure development and ecosystem management are increasingly apparent as we focus on actively investing in ecosystem "services" and shift away from merely "preserving nature." Florida's "greenways" program, for example, was recently characterized as an effort to give the state "a 'green infrastructure,' as carefully planned and managed as our highway system." MARK L. SHAFFER, THE WILDERNESS SOCIETY, LIFELANDS 15 (1994) (quoting Nathaniel P. Reed, vice chair of the Florida Greenways Commission).

130. Jeffrey McNeely of the World Conservation Union ("IUCN") has been an especially tireless proponent of efforts to understand the role of local community organizations, and to respect and support customary practices that provide means of living sustainably within ecosystems, as an integral part of global nature conservation. *See, e.g.* Jeffrey A. McNeely, *Common Property Resource Management or Government Ownership: Improving the Conservation of Biological Resources*, 10 INT'L REL. 211 (1991); CULTURE AND CONSERVATION: THE HUMAN DIMENSION IN ENVIRONMENTAL PLANNING (Jeffrey A. McNeely & David Pitt eds., 1985).

131. The recognition of local community traditions and culture as irreplaceable social capital has been particularly well-articulated in the international arena. Following the strong statements on the subject in 1987 by the World Commission on Environment and Development, WORLD COMM'N ON ENVT. AND DEV., *supra* note 49, at 12, 114-16, the United Nations Conference on Environment and Development adopted numerous statements about the need for recognizing and supporting the roles of local communities in general, and indigenous people in particular. The Rio Declaration calls on states to "recognize and duly support [the] identity, culture and interests" of local communities. *Rio Declaration*, *supra* note 51, Principle 23. Other provisions in the UNCED documents likewise endorse efforts to respect and preserve traditional knowledge and practices that comport with concepts of sustainable use. *E.g.*, *Forest Principles*, *supra* note 56, Principles/Elements ¶ ¶ 5(a), 12(d); Convention on Biological Diversity, *supra* note 58, arts. 8(j), 10; *Agenda 21*, *supra* note 52, ¶ 3.12 (urging states to "focus capacity-building at the local community level in order to support a community-driven approach to sustainability"). *See* Breckenridge, *supra* note 28 (examining in detail the developments in international environmental law that relate

An ability to exclude others from a clearly delineated area, so that the group reaps the benefits of investments in the ecosystem, appears to be one crucial factor in the development of sophisticated local institutions.[132] More broadly, the existence of clear incentives and authority for members of the group to invest in the creation of institutional arrangements is important.[133] The rise of the global exchange economy has in many ways undermined incentives that once existed for such efforts. A community that depends for its long-term survival on the viability of the immediately surrounding ecosystem in a subsistence economy may readily perceive harms to the biological diversity of the local environment as costs to the community, and take measures to avert them, but communities that are tied to monocultural production and participation in international markets may not do so as readily.[134]

These pragmatic considerations raise questions not simply about the current practices of a given local community, but also about its flexibility and ability to adapt to new ecological information and norms introduced from the outside, especially when the actions of the community have impacts on others outside the group.[135] A pressing issue in the burgeoning sustainable development literature is whether and in what circumstances groups that do participate extensively in a global economy may nevertheless come to establish forms of self-regulation that provide the means for remaining sensitive to, and adjusting to, local ecological conditions.[136]

These observations about the "good" and "bad" attributes of local communities highlight the extent to which local arrangements, whether embodied in formal legal requirements or customary practices, may amount to a kind of social capital from the perspective of a larger public that depends in various ways on the wise management of ecosystems. Conversely, a lack of

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to recognition of local community roles).

132. OSTROM, *supra* note 77, at 90-92; OSTROM ET AL., *supra* note 71, at 303-304.

133. McNeely, *supra* note 130, at 222-24.

134. *E.g.*, Richard B. Norgaard, *The Rise of the Global Exchange Economy and the Loss of Biological Diversity*, *in* BIODIVERSITY, *supra* note 21, at 206-11.

135. Ellickson, *Property in Land*, *supra* note 128, at 1400 (noting that an efficient and sophisticated land regime from the community's perspective may nevertheless cause significant spillover effects that harm outsiders).

136. The role of government in fostering self-regulation is addressed further in part III.D., *infra*.

effective local organization may scuttle the most well-intentioned centralized programs, which may exist only on paper without the support and cooperation of people who live in the area being managed.[137]

In the Northern Forest, these complex considerations have produced the ambivalently mixed expressions of alliance and antipathy between local representatives and environmentalists. People in local communities of the Northern Forest are both knowledgeable about, and deeply dependent on, the renewable resources of the forest.[138] They have a stake in the forest, even if they lack title to lands that are held by corporations and large investors. They may place a high value on seeing biological diversity maintained in this environment, and they may use the forest for hunting, fishing, and recreation.

Most livelihoods in the forest are not closely identified with the cultivation of a biologically diverse ecosystem, however, because the economy of the region rests to an important degree on the exploitation of the land for timber and the participation in global market transactions.[139] The landowners who acquire land for timber or development may have little incentive to invest in aspects of the ecosystem that are not directly related to those purposes. And, while there is a strong tradition of participation in local government, the practical authority that local communities exercise over the exploitation of resources is quite limited in parts of the Northern Forest. In Maine, in particular, vast areas of the forest have small populations and no municipal government, leaving large corporations and state government agencies as the dominant forms of "local" control.[140] In these circumstances, questions about the ecological qualifications of local communities abound. Are local communities good stewards of the forest? Could they become good managers through some process of internal transformation, or through creation of different external incentives, or through changes in definitions of legal authority?

This simplified depiction of an ecosystem management perspective on local organization may appear to cast the potential

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137. *See, e.g.*, WORLD RESOURCES INSTITUTE, ET AL., *supra* note 24, at 79-83.

138. NFLS, *supra* note 1, at 33-37.

139. TECHNICAL APPENDIX, *supra* note 1, § 5 (reports of the Local Forest-Based Economy Subcommittee); PHILLIPS, *supra* note 1.

140. NFLS, *supra* note 1, at 33.

role of local communities in an unduly instrumental light; local communities are more than means to an ecologically sound end. To put the assertions about local communities in context, it should be noted that similar observations about the importance of group culture and internal decision-making processes apply equally to all of the other forms of organization for dealing with natural resources, including government agencies, corporations, non-profit organizations, and professional associations.[141] For example, we are equally justified in asking whether the Environmental Protection Agency, International Paper, the Nature Conservancy, or the Society of American Foresters have organizational cultures that coincide with an ecosystem management approach, and whether interactions among or within groups can foster or redirect the way in which they exercise regulatory, ownership, or managerial authority over the natural resources that they control.

3. The Local Role Within Larger Systems

In short, the view of local organization from the perspective of ecosystem management goes beyond a critique of fragmentation and a drive to transcend institutional boundaries. The attitude toward boundaries, and toward the separate entities they define, is much more complex. Local forms of self-regulation are sometimes a form of valuable social capital that no superseding central system can readily provide. Tradition and culture may represent learning and wisdom about living sustainably within an ecosystem that cannot be equivalently supplied by centralized expert analyses.

This respect for local forms of organization rejects, however, any reliance on tradition in the rigid sense of blindly following the

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141. *See* Errol Meidinger, *Regulatory Culture: A Theoretical Outline*, 9 LAW & POL'Y 355 (1987) (outlining role of culture in regulatory agencies, drawing on a broader literature about how shared understandings develop and organize action in groups); Manik Roy, *Pollution Prevention, Organizational Culture, and Social Learning*, 22 ENVTL. L. 189 (1992) (focusing on the cultures of corporations and environmental agencies engaged in addressing pollution issues); Gerald Torres, *Theoretical Problems with the Environmental Regulation of Agriculture*, 8 VA. ENVTL. L.J. 191 (1989) (comparing the cultures of the Department of Agriculture and the Environmental Protection Agency); ENVIRONMENTAL LAW AND ECOLOGICAL RESPONSIBILITY: THE CONCEPT AND PRACTICE OF ECOLOGICAL SELF-ORGANIZATION (Gunther Teubner et al. eds., 1994) [hereinafter ENVIRONMENTAL LAW AND ECOLOGICAL RESPONSIBILITY] (focusing primarily on the possibilities of business self-regulation).

patterns of the past. It is only when traditions carry with them an insight into how to live sustainably in the future that the "old ways" provide a map for where to go next.[142] Similarly, the support for "stability" of local communities in this view takes on an ecological twist.[143] The ecosystem management perspective backs the development of local forms of self-organization that allow the community to adapt resiliently and survive in the face of disruption, but it rejects rigid adherence to past practices of exploitation when the result is a loss of ecological integrity.

The pursuit of unification, coordination, and holistic analysis that we find in ecosystem management therefore includes at the same time an affirmative search for ecologically-sound forms of social differentiation and local organization. The seemingly paradoxical allegiance to both centralization and localism in human organization is closely related to the "hierarchy of scales" that conservation biologists bring to ecosystem management projects.[144] The broad aims of conservation biology are to support the functioning of a world composed of semi-autonomous, self-organizing subsystems, which interact within a nested hierarchy of larger systems. By logical extension, an ecosystem management approach not only tolerates but endorses a diverse array of semi-autonomous human organizations—if they operate adaptively within the parameters of larger ecological systems.

In a world where centralized government programs offer no easy solutions, the search for institutional arrangements has turned from unilateral, monolithic answers to a consideration of whether smaller-scale organizations might, through a network of voluntary agreements, coordinate and influence each others'

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142. Rebeccca Brown's observations about the role of tradition in constitutional interpretation are relevant in this context as well:

> [Tradition] represents the judgments of earlier generations, revealing choices they have made and values they have adopted. Tradition thus has the capacity to teach us from where we have come, and to cast light on where we may go. It can enrich our understanding of our own world by allowing us to see the possibilities, the consequences, and the limits of human experience. The value of tradition is that it supplies the potential for insight.

Rebecca L. Brown, *Tradition and Insight*, 103 YALE L.J. 177, 222 (1993).

143. The ecosystem management goal of resilience, as distinct from static forms of stability, is discussed in *supra* part I.B.1. *See also* Joseph L. Sax, *Some Thoughts on the Decline of Private Property*, 58 WASH. L. REV. 481, 490 (considering the goals of community stability as related to "sustenance, continuity, adaptation and evolutionary change," and noting the similar focus on continuity of natural systems in ecology).

144. *See supra* notes 42 and 114. *See also* OSTROM, *supra* note 77, at 101-102 (on institutional organization in multiple layers of "nested enterprises").

activities "from the bottom up," instead of awaiting "top-down" national prescriptions. As discussed in the next part, the rhetoric of "partnership" currently dominates the search for new forms of collective decision-making.

III. PARTNERSHIPS FOR ECOSYSTEM MANAGEMENT

A. The Rhetoric of Partnership

Words of "partnership" now pervade the pronouncements of governments, corporations, and non-profit organizations on ecosystem management. The Council on Environmental Quality summed up the trend in a recent annual report: "Today scientists, policy makers, regulators, and natural resource managers are recognizing that managing isolated parts of an ecosystem is ineffective. In response, they are advocating cooperative management of regional ecosystems by public and private partners."[145] Examples of statements of commitment to the partnership idea abound. The 1993 National Performance Review report on Reinventing Environmental Management,[146] the report of the President's Commission on Environmental Quality (entitled *Partnerships to Progress*),[147] the Environmental Protection Agency's 1994 five-year strategy,[148] and policy statements of the Forest Service and other agencies,[149] for instance, all call for the formation of partnerships among governmental, professional, corporate, and non-profit organizations as the means for accomplishing ecosystem management.

Such statements mirror the extensive adoption of partnership language in international documents. Conclusions about the role of "partners" and the need to form partnerships in order to

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145. COUNCIL ON ENVTL. QUALITY, TWENTY-FIRST ANNUAL REPORT, *supra* note 70, at 142.

146. OFFICE OF THE VICE PRESIDENT, *supra* note 69.

147. PRESIDENT'S COMM'N ON ENVTL. QUALITY, PARTNERSHIPS TO PROGRESS: THE REPORT OF THE PRESIDENT'S COMMISSION ON ENVIRONMENTAL QUALITY (1993).

148. U.S. ENVTL. PROTECTION AGENCY, *supra* note 68.

149. *E.g.*, U.S. DEPT. OF AGRIC., THE ROLE OF THE NORTHEASTERN AREA IN ECOSYSTEM MANAGEMENT: STATE AND PRIVATE FORESTRY 4-5 (1994) (ecosystem management goals to be pursued by "[i]dentifying key players and organizations and encouraging the formation of partnerships"); U.S. GEN. ACCOUNTING OFFICE, *supra* note 65, at 57-59, 70-86 (discussing need for, and obstacles to, formation of partnerships, and appending comments on this subject from other agencies).

achieve sustainable development dominate the consensus reached at UNCED.[150] Agenda 21 uses words of partnership repeatedly throughout its text in referring to the relationships that must be built among international, national, regional, and local authorities, landowners, and groups of all sorts, including women, youth, indigenous people, scientists, and businesses, in order to manage ecosystems sustainably.[151]

Several key characteristics of the rhetoric of partnership point to potentially important substantive effects. First, this is language that acknowledges the limits to power of all actors. No one institution or organization, even in government, is capable of finding and implementing solutions alone. Second, it recognizes that the dispersed power to dictate or influence outcomes comes in many forms, without regard to legal designations; this is a world of "stakeholders" who exercise power in any number of different ways including sovereign authority, property rights, purchasing power, rights to vote, rights to participate in others' decision-making, and access to the press. Distinctions between "public" and "private" functions are largely disregarded as the discussion draws in all claims to authority and influence. Third, the emphasis ultimately is on groups rather than individuals; partnership proposals presuppose internal institutional decision-making processes of all sorts, in addition to interorganizational coordination. Finally, the rhetoric of partnership advocates voluntary, collaborative decision-making processes among organizations and institutions, in contrast to unilateral managerial solutions.

B. The Forms and Legal Tools of Partnership

The general notion of partnerships as an approach to land conservation is not new, but the references to partnership in the 1990's reflect some significant new trends.[152] In the past,

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150. The Rio Declaration declares the goal of "establishing a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of societies and people." *Rio Declaration*, *supra* note 51 (Preamble).

151. *See Agenda 21*, *in* UNCED REPORT, *supra* note 52. *See also* Breckenridge, *supra* note 28, at 775-82 (discussing themes of partnership and co-management in the UNCED documents).

152. A number of recent publications have examined the trends in collaborative efforts for land conservation. LAND CONSERVATION THROUGH PUBLIC/PRIVATE PARTNERSHIPS (Eve Endicott ed., 1993) [hereinafter LAND CONSERVATION]; NATIONAL RESEARCH COUNCIL,

cooperative land conservation efforts have typically involved bilateral arrangements focused on setting aside particular areas of land from development or preventing environmental degradation.[153] Joint projects by federal and state agencies, federal assistance to private concerns, and land acquisition agreements between nonprofit organizations and landowners might all be termed partnerships in a broad sense, in view of the collaborative, nonhierarchical nature of the endeavors, even though they may involve short-term projects or one-time transfers of assets rather than ongoing relationships.[154]

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supra note 82, at 139-81 (1993); FREDERICK J. LONG & MATTHEW B. ARNOLD, THE POWER OF ENVIRONMENTAL PARTNERSHIPS (1995). *See also* V. ALARIC SAMPLE, FOREST POLICY CENTER, BUILDING PARTNERSHIPS FOR ECOSYSTEM MANAGEMENT ON FOREST AND RANGE LANDS IN MIXED OWNERSHIP (1993) (report of a workshop on ecosystem management). The Northern Forest proceedings led to the preparation of numerous useful studies gathering information on forms of shared ownership or management and other cooperative approaches. *See* PETER FORBES, ET AL., THE TRUST FOR PUBLIC LAND, USING CONSERVATION EASEMENTS IN THE NORTHERN FOREST LANDS: BUILDING PARTNERSHIPS FOR LAND PROTECTION (1989); Myers, *supra* note 15; Robert G. Healy & Preston Bristow, *Shared Ownership of Forestlands: Experience and Propspects*, *in* CONSERVING THE NORTH WOODS, *supra* note 1.

153. For example, the U.S. Department of Agriculture's programs have involved long used a voluntarist approach, offering subsidies and technical assistance, and emphasizing cooperation and coordination with other government agencies and private concerns. *See* Torres, *supra* note 141.

154. Not all concepts of "partnership" are non-coercive from the perspective of the private landowner. One form of partnership that received considerable attention during the Northern Forest proceedings was "greenlining":

> [G]reenlines are large land areas that are protected through a partnership of local, state, and federal governments under a coordinated regional plan. A variety of protection techniques can be employed: zoning, fee and less-than-fee acquisition, land trusts, tax incentives, and regulatory mechanisms. The federal role is generally limited to cost-sharing grants, leadership, technical assistance, and in some cases, acquisition of critical areas. Most lands remain in private ownership, and resource-based activities such as farming and forestry, are encouraged.

Robert D. Yaro & Kathy Sferra, *"Greenlining" in the Northern Forest Lands of New England and New York*, *in* CONSERVING THE NORTH WOODS, *supra* note 1, at 149, 152. *See also* Robert J. Lilieholm & Jeff Romm, *Pinelands National Reserve: An Intergovernmental Approach to Nature Preservation*, 16 ENVTL. MGMT. 335 (discussing the potential application of the New Jersey Pinelands model to New England's forests); Cecily C. Kihn, *The Future of the Greenline Concept*, AM. LAND F., Winter 1982, at 9; GREENLINE PARKS: LAND CONSERVATION TRENDS FOR THE EIGHTIES AND BEYOND (Marjorie R. Corbett ed., 1983). The idea of greenlining was controversial in the Northern Forest proceedings because the term suggested an emphasis on intergovernmental coordination that might override local and private decisionmaking, much as New York's Adirondack Park Agency has imposed land use controls on private lands within the "Blue Line" of the Adirondack Park. Reidel, *A Public/Private Cooperative Paradigm*, *supra* note 13, at 157-61.

The 1990's have brought ever more complex concepts of partnership as ecosystem management ideas have broadened the focus of conservation planning far beyond the boundaries of nature reserves, exceeding the limited financial and legal abilities of individual organizations. Partnership efforts increasingly involve multilateral arrangements among widening numbers and types of organizations. The Nature Conservancy now lists an array of at least five partners to include when conservation planning encompasses an entire ecosystem and seeks to integrate ecological and economic considerations:

> (1) a local land conservation organization, such as The Nature Conservancy; (2) a broadly based citizens group pursuing conservation, community and economic development; (3) local government working cooperatively with the other groups; (4) an institute or other entity conducting applied research on diverse issues, as well as measuring success; and (5) a sustainable development corporation helping to launch compatible businesses and create jobs.[155]

In addition to including a larger number of parties, "partnerships" increasingly refer to ongoing, or at least long-lasting, relationships that involve developing a jointly defined agenda with specific goals, and engaging in an interactive process in which there are prospects for joint learning and behavioral change.[156] A shared sense of mission and long-term coordination in the exercise of authority are critical factors in the more ambitious recent partnership efforts at ecosystem management.[157]

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155. *The Question of Sustainable Development*, NATURE CONSERVANCY, Jan./Feb. 1995, at 11, 13.

156. LONG & ARNOLD, *supra* note 152, at 5-8; LAND CONSERVATION, *supra* note 152, at 3-11.

157. LONG & ARNOLD, *supra* note 152, at 169-74. One recent report describes the new complex arrangements this way:

> Numerous owners have legal rights and entitlements intertwined in various ways. Decisions of one owner are linked to the others, and the choices of one manager can set a course that might be influential for all. In a variety of formal and informal ways, multiple owners are brought together in a web of common understandings, mutual expectations, and legal duty.

NATIONAL RESEARCH COUNCIL, *supra* note 82, at 176.

Nonprofit organizations are at the forefront of these developments, and they have taken the lead in facilitating projects and seeking new modes of coordination among organizations.[158] The Nature Conservancy's Last Great Places Campaign has been one particularly prominent program to create "bioreserves" elaborated along the general lines of a model envisioned by the United Nations Man and Biosphere Program.[159] The Virginia Coastal Reserve and the not-yet-successful efforts to develop a comprehensive management plan for the Balcones Canyonlands of the Texas Hill Country, for instance, are among the recent projects that have involved coordinated action by The Nature Conservancy, multiple government agencies, private landowners and businesses, and other organizations.[160]

In the Northern Forest proceedings, likewise, proponents of an ecosystem management approach sought to elaborate complex multi-party partnerships, within the boundaries of a "green line," that would rely extensively on institutionalized public involvement and voluntary, shared ownership and management arrangements, as well as federal, state, and local government collaboration, and action by non-profit organizations.[161]

Such ecosystem-wide projects inevitably turn to an array of legal tools to piece together a coherent ecosystem management regime that cuts across preexisting boundary lines and provides for ongoing investigation and decision-making. The variety of potential legal arrangements includes not only the traditional acquisition of park land in fee simple but also the creation of

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158. NATIONAL RESEARCH COUNCIL, *supra* note 82, at 139-56, 175-81.

159. John C. Sawhill, *Last Great Places: An Alliance for People and the Environment*, NATURE CONSERVANCY, May/June 1991, at 6. The biosphere reserve model involves a core nature reserve, surrounded by one or more buffer zones in which uses are tailored to ensure the protection of the vulnerable aspects of the ecosystem while at the same time providing the basis for economic development. *See, e.g.*, Curtis J. Badger, *Eastern Shore Gold*, THE NATURE CONSERVANCY MAGAZINE, July/Aug. 1990, at 7, 11-13 (discussing application of the biosphere reserve concept on Virginia's Eastern Shore).

160. John C. Sawhill, *supra* note 159; NATIONAL RESEARCH COUNCIL, *supra* note 82, at 153-56; Eve Endicott, *in Preserving Natural Areas: The Nature Conservancy and Its Partners*, LAND CONSERVATION, *supra* note 152, at 17, 41-42. Many other organizations are engaged in efforts that similarly involve weaving together multiple forms of resource management authority along ecosystem lines. Endicott, *supra*; PETER FORBES ET AL., *supra* note 152, at 51-66.

161. These proposals were for a cooperative, public/private variant of existing models of greenlining. *See supra*, note 154; *Reidel, A Public/Private Cooperative Paradigm*, *supra* note 13, at 161-64.

conservation easements, co-tenancies, leasing arrangements, or management contracts, as well as the exercise of governmental regulatory authority, including local zoning powers, to establish agreed-upon measures.[162] The search for new and more creative arrangements is ongoing. While many conservation efforts in the past have focused simply on setting land aside from development or ensuring the continuance of existing uses, new endeavors face the challenges of bringing about agreements between businesses and other parties in order to foster "sustainable" economic development.[163]

I will make no attempt here to catalogue the many forms that innovative legal arrangements have taken, but focus instead on some general characteristics of these recent endeavors that make them, collectively, a distinctive approach to decision-making and the manifestation of a significant trend in environmental policy.

C. Implications and Effects of Partnership Arrangements

1. Partnerships as Hybrid Systems

In emphasizing the voluntary, collaborative aspects of partnerships and contrasting the managerial, hierarchical characteristics of government regulatory systems, proponents of partnership arrangements focus on the contrast between hierarchies and contracts, centralized management and decentralized bargaining.[164] It would be incorrect, though, to characterize the newest forms of environmental partnership as purely decentralized decision-making. The interactions among the partners may result in an institutional structure that itself functions as an ongoing, coordinated enterprise.[165] The effect is

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162. Myers, *supra* note 15; LAND CONSERVATION, *supra* note 152.

163. *See* Jeff Cherry, The Bioreserves Program: Assessing the Legal and Socioeconomic Impacts of a Broader New Role for the Nature Conservancy (Apr. 13, 1993) (unpublished manuscript, on file with the author) (examining the challenges of incorporating attention to economic development in programs of The Nature Conservancy).

164. *See, e.g.*, Ronald H. Coase, *The Nature of the Firm*, 4 ECONOMICA 386 (1937). Lon Fuller similarly drew a distinction between hierarchies and markets in observing that managerial direction and contract (or reciprocity) are the two methods available for resolving polycentric problems that are not susceptible to adjudication. Polycentric problems are problems that (like those of ecosystems examined here) involve a web of relationships in which an event affecting one part has complex, nonlinear repercussions in multiple directions. Lon L. Fuller, *The Forms and Limits of Adjudication*, 92 HARV. L. REV. 353, 395, 398-99 (1978).

165. The relationship among the partners is analogous to an incomplete long-term

to erode partially the autonomy of the individual organizations, and (since the participants in partnerships may be both private and public entities) the distinction between public and private functions.[166] Partnerships for managing ecosystems are best seen as attempts to develop new hybrid forms of decision-making, a "third way," that is decentralized and "private" enough to allow diverse, semi-autonomous action, but at the same time centralized and "public" enough to achieve coordination on a region-wide basis.[167]

The potential nature of the relationships can be illustrated by looking at some specific arrangements between government agencies and nonprofit organizations. Nonprofit organizations act more and more frequently as intermediaries between private landowners and governments, brokering agreements, serving as intermediate buyers that purchase and hold property temporarily until public funds become available, and sometimes retaining residual rights after reconveyance for the sake of overseeing future management practices. Such arrangements depend on a joint understanding, if not a formal contractual agreement. When there may be a series of such purchases, in particular, the two

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contract. The participants maintain their formal autonomy and interact through bargaining, but their autonomy is in fact constrained as a result of their relationship-specific (and ecosystem-specific) investments. Their agreements come to include procedures for filling in the "gaps" and making mutual adjustments over time. Ian R. Macneil, *Contracts: Adjustment of Long-Term Economic Relations Under Classical, Neoclassical, and Relational Contract Law*, 72 NW. U. L. Rev. 854, 887-94 (1978). There is a growing literature in economics on relational contracting that considers the circumstances in which incomplete long-term contracts arise among business enterprises. *E.g.*, THE NATURE OF THE FIRM: ORIGINS, EVOLUTION, AND DEVELOPMENT (Oliver E. Williamson & Sidney G. Winter eds., 1993); OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING (1985). The motivations and organizational behavior found in ecosystem partnerships are particularly complex, because the partners include government agencies engaged in regulatory activity, nonprofit organizations, and businesses. *See* Daniel B. Rodriguez, *The Positive Political Dimensions of Regulatory Reform*, 72 WASH. U. L.Q. 1, 32-42 (1994) (noting similarities and distinctions between business firms and administrative agencies, and the failure of the new economics of organization to address adequately the factors affecting agency decision-making).

166. LAND CONSERVATION, *supra* note 152, at 8-9; NATIONAL RESEARCH COUNCIL, *supra* note 82, at 49.

167. *See* Richard B. Stewart, *Reconstitutive Law*, 46 MD. L. REV. 86, 86 (1986) (rejecting the false dilemma of choosing between centralized regulation and markets, and advocating a third approach, "new reconstitutive regulatory strategies that simultaneously promote national goals, decentralize decision-making, and allow states, localities, business enterprises, and nonprofit institutions greater independence and flexibility"). *See also* Menell, *supra* note 128, at 505-10.

groups may work to develop a joint plan of action and to coordinate their day-to-day decisions through informal consultation or specific procedures. In such circumstances, the interactions may also bring about changes in the participants themselves. The nonprofit organization reorders its own priorities in response to information about the government agency's land acquisition goals, while the agency constrains its own discretion in spending funds in order to join in the organization's agenda.[168]

Similar observations might be made about interactions between nonprofit organizations and landowners. Unlike one-shot transactions that shift property uses through transfers between autonomous actors, conveyances of conservation easements or contracts providing management authority may establish long-term, open-ended relationships, in which procedures for identifying joint goals, adapting to new information, and sorting out disagreements are crucial.[169]

The more the parties establish ongoing procedures for streamlining their joint decisions about changes, agreeing on standards, setting rules about alienation, or even hiring a manager to act on their behalf, the less they depend upon the negotiation of separate transactions, and the more their relationship becomes an oragnization with an internal governance structure. The institutional aspects of the joint arrangements may not be readily apparent, since they may include informal understandings or appear only as an array of unpublished documents, but the nature of the mutual adjustments shows that a system for collective action is in place, even while the participants remain semi-autonomous in their decision-making.

2. Partnerships as Social-Republican Property

In a fully elaborated form, the nature of these arrangements is perhaps best described by analogy to cooperative institutional

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168. *E.g.*, Phyllis Myers, *Direct Funding of Nonprofit Land Protection: A New Genre of State Land Conservation Programs*, *in* LAND CONSERVATION, *supra* note 152, at 258 (surveying the increasingly formalized partnership arrangements between states and nonprofit organizations).

169. *See generally* PETER FORBES ET AL., *supra* note 152 (discussing use of conservation easements and their effect on long-term interactions); Cherry, *supra* note 163 (noting constraints on autonomous action by the nonprofit organization when it seeks to develop long-term relationships in a community).

structures that join private property rights with participation in a group or community, such as certain producer and housing cooperatives. William Simon has described such institutional regimes as "social-republican" property, distinguishing these arrangements from those of classical liberalism (which sharply separates the prerogatives of private property from political rights), classical socialism (based on state ownership of property), and social democracy (which relies on a system of private property in the classical liberal tradition, tempered by regulatory restrictions and wealth transfers in the form of welfare rights):

> Social-republican property can be distinguished from the more conventional notion of capital ownership, which might be called "liberal private" property, by two features: first, transfer or alienation restraints that confine control of the property to active or potentially active participants in a community constituted by the property, and second, accumulation restraints designed to limit inequality among members of such a community. These core features of social-republican property operate as restraints on the commodification and capitalization of relationships.[170]

Of the two characteristics mentioned, ecosystem management partnerships adhere conspicuously to the proscription on unilateral alienation of property. Like the institutional structures Simon describes, these arrangements amount to co-ownership or co-management regimes that limit unilateral action and impose restraints on alienation of resources. Land that once could be freely sold and converted to other uses, and resources that could be freely harvested, extracted, and marketed by a single organization are now tied down through conditions that preclude transactions or require agreement of other parties prior to any change. These arrangements encourage long-term investment in human and ecological relationships, ensuring that capital (including, in this case, "natural" capital) is sufficiently retained to support ecosystem functions, and establishing the means for realization of non-commodity values.[171]

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170. William H. Simon, *Social-Republican Property*, 38 UCLA L. REV. 1335, 1341 (1991).

171. *Id.* at 1341-44.

Are the complexities of such management regimes worth it? The rather substantial costs of creating and operating a system of joint decision-making should not be overlooked. As John Sawhill, president of The Nature Conservancy, observed while commenting on the shift to "bioregional" management through coordination with multiple parties: "There is a new bureaucracy involved, which requires much adjustment and some frustration for those who want to be in the field."[172]

It is often argued that shared ownership arrangements and restraints on alienation typically produce inefficient outcomes, because transactions that could result in resources moving to more valued uses are unnecessarily precluded or burdened.[173] The defense of social-republican property rests on an assertion that the values derived through shared ownership or co-management are greater than they would be through unitary control and commodification, and that the increased transaction costs are consequently justified.[174] In the case of ecosystem management arrangements, the relevant noncommodity values pertain not simply to the intangible benefits of developing a sense of community through joint deliberations, but also quite concretely to the material benefits of keeping a biologically diverse ecosystem alive as a "going concern."[175]

The second characteristic that Simon mentions, a commitment to equality, is likewise relevant.[176] Proposals for ecological "partnering" emphasize the importance of ensuring equal status among the participants, engaging even parties that might not usually be viewed as equal, and seeking consensus through "win-win" solutions.[177] More broadly, the substantive goals of ecosystem management have egalitarian implications

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172. Daniel B. Wood, *Natural Sites Protected as Bioregions*, CHRISTIAN SCI. MONITOR, Oct. 3, 1991, at 10. *See also* NATIONAL RESEARCH COUNCIL, *supra* note 82, at 176 (noting the management difficulties of multi-party arrangements); PETER FORBES ET AL., *supra* note 152 (evaluating benefits and detriments of partnership arrangements expressed through conservation easements).

173. Epstein, *supra* note 78, at 971-72.

174. Simon, *supra* note 170, at 1388-1403.

175. *See supra* note 78 and accompanying text.

176. Simon, *supra* note 170, at 1344-50.

177. PRESIDENT'S COMM'N ON ENVTL. QUALITY, *supra* note 147, at 39 ("Key stakeholders must be involved as equal parties in the partnership. Equity issues can be addressed even when participants have an unequal power base. . . . Since other public policy approaches are characterized by power politics, this aspect of partnerships is particularly important.").

reaching beyond the immediate participants in the partnership; the concerns with fostering the survival of all species and providing for future generations of people are distributional concerns, which entail allocating resources to serve an entire, continuing, ecological community instead of permitting any one group to reap disproportionate benefits.[178]

A valid question about partnerships, though, is whether they provide for equal distribution of benefits within organizations or to people who are not participating effectively in the partnership as a group. We must recall that ecosystem management partnerships are typically organizations of organizations rather than simply groups of individuals. The socioeconomic issues related to accumulation and distribution of benefits derived from the uses of ecosystems are important challenges. In order to tackle "sustainable development" and not simply "nature conservation," partnerships seek to address the goal of ensuring adequate and equitable access to resources by all human populations, as well as protection of ecosystems. The Nature Conservancy's expanded list of participants needed for a successful ecosystem management partnership, discussed earlier, and other recent commentaries, reflect efforts to be more inclusive, and to pay more attention both to the economic viability of local communities and to previously ignored ecological concerns.[179] But the ecosystem management regime that is developed in a given situation will depend on the particular orientations and commitments of the participating organizations.[180]

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178. *See* Lazarus, *supra* note 75, at 1769 n.191. *See also supra* notes 30, 48-49, 75 and accompanying text.

179. *See supra* note 155 and accompanying text; LONG & ARNOLD, *supra* note 152, at 4-7, 30-31.

180. Partnerships thus show promise as a way to include individuals in environmental decision-making processes, and to "reconceive the setting within which individual autonomy may prosper by focusing on the kind of natural environment necessary for individuals to thrive." Lazarus, *supra* note 75, at 1774. But alternatively, some partnership arrangements could serve to reinforce existing allocations of power and to exclude from decision-making those who currently lack property or regulatory authority, particularly if the bargaining occurs outside of a public forum. *Cf.* Owen M. Fiss, *Against Settlement*, 93 YALE L.J. 1073, 1076-77 (1984) (examining effects of an imbalance of power in context of alternative dispute resolution of litigation). The representativeness of the participants, as well as the background laws affecting access to the negotiations, are issues that have not been thoroughly addressed in the context of ecosystem management proposals. As discussed in part IV.D, *infra*, the successful attainment of national and global ecosystem management purposes may consequently hinge on the formulation of

Even when partnerships succeed in engaging "key stakeholders" and ensuring a rough equality in their status during negotiations, the result will not be equivalent to giving all members of the public equal access to the same resources. Ecosystem management partnerships are more inclusive than a private property regime premised on unilateral economic development, but they are also more exclusive than a government-run system premised on uniform regulation that seeks to treat all parties in the same way. A certain regional parochialism is inherent. All forms of social-republican property rely on building long-term relationships, restricting membership, controlling conditions of entry, and limiting the distribution of benefits to those who have invested in the enterprise.[181] In the ecosystem management context, exclusiveness has peculiarly ecological justifications. To stay within the constraints of sustainability, incompatible uses must be effectively excluded. At the same time, in order to foster the creation of an authoritative, ecosystem-based, decision-making community, sustainable uses may need to be allocated as nearly as possible to those who contribute to maintaining ecosystem functions by developing rules and monitoring compliance. The knowledge and practices of individual participants matter greatly to the success of the total endeavor, and the ability to realize benefits from the ecosystem provides important incentives for continued participation. In the amalgam of legal tools that ecosystem management partnerships use, the exclusionary prerogatives of the partnership or of its members, whether asserted as property rights or as government regulation, are important means for bringing the uses of the ecosystem within sustainable limits while setting the basis for local economic development, but they are also tools that may create distinctive local privileges as well as responsibilities.[182]

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governmental measures affecting the context and content of partnership bargaining.

181. Simon, *supra* note 170, at 1403-12.

182. The place-oriented aspects of partnerships may pose important challenges to the accepted roles of government agencies, particularly in their exercise of regulatory authority. For example, the EPA has stated its commitment to a more "place-driven" approach, *see supra* note 68, but the potential localism implicit in such a commitment may not always fit easily with the goals of even-handedness and uniformity that are central to federal environmental statutes. *See* Rose, *The Ancient Constitution*, *supra* note 128 at 84-89 (examining themes in the Federalists' program of centralization and commercialization that are in tension with traditions of localism).

3. Partnerships as Systems for Ecosystem Management

Do partnership arrangements deal more readily with the challenges of an ecosystem management approach than a centralized, government-directed system? One argument in favor of the partnership structure is simply that the prospects for a workable, politically acceptable, central solution are remote, and, in the absence of unitary action, it seems wise to marshal an array of legal tools by encouraging the participation of many parties. But we can also pinpoint some attributes of partnerships that fit affirmatively with the aims of ecosystem management. First, they offer a means of transcending the boundaries that pose obstacles to a landscape-based or regional analysis, without succumbing to the drawbacks of the search for comprehensive national answers. The level of organization, in other words, is appropriate to the chosen scale of analysis. Partnerships provide a framework for incorporating the "social capital" of subsystems developed at the local level, and within the legal limits of discretion and the practical limits of mutual influence, they further provide a structure for coordinating fragmented authorities in a regionally-specific way. Partnerships also offer some market-like qualities, although some of the transactions may not be monetary. When information must be gathered and assessed, hypotheses tested, and plans of action periodically reevaluated, partnerships may provide better means for adaptive action and for local adjustments to optimize uses. While they may be unable to provide comprehensive answers, they may be well suited for taking multiple incremental actions in an iterative process that copes with changes in conditions and uncertainty of goals through periodic renegotiation and deliberation. This is not to say that partnerships will necessarily form easily or adjust rapidly, since the costs and delays of engaging many parties in decision-making may be high.[183] But if the participants succeed in building rules governing their collective activities that accommodate changes over time, then it seems possible that the ecosystem will be more effectively managed and human needs will be more efficiently accommodated than if rules were merely imposed by some central authority.[184]

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183. *See supra* note 172.

184. Studies of the management of common-pool resources support the conclusion that tightly-knit local communities do manage to achieve more efficient outcomes than

An issue that this rather procedural account does not fully address is whether such collaborative arrangements are readily able to maintain a commitment to the substantive national and global goals of protecting ecosystem functions and fostering biological diversity. The Northern Forest proceedings were the manifestation of one significant attempt to organize collaboratively along ecosystem lines, and they offer some possible insights into the difficulties of ensuring that partnerships will form to meet sufficiently stringent, ambitious goals.

D. Prerequisites for Partnerships: Some Thoughts About the Northern Forest

The outcome of the Northern Forest proceedings suggests that adoption of a joint "vision," and a commitment to dialogue and collaboration are not enough to bring about the hard choices necessary to establish an ecosystem management regime. The

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centralized regimes when a culture of reciprocity helps them to overcome collective action problems. OSTROM ET AL., *supra* note 71, at 45, 315-16. A large question that remains is whether more heterogeneous and complex partnerships of the sort that we are considering here can achieve analogous forms of self-organization. *Id.* at 316. Drawing on game theory, studies of collective decision-making suggest that frequent and continuing interactions among parties, leading to development of a self-reinforcing system of reciprocity, would be an important aspect of achieving the forms of self-organization that ecosystem management partnerships presuppose. *Id.* at 327-29; ROBERT AXELROD, THE EVOLUTION OF COOPERATION 169-91 (1984); William H. Rodgers, Jr., *The Evolution of Cooperation in Natural Resources Law: The Drifter/Habitué Distinction*, 38 U. FLA. L. REV. 195, 202-03 (1986). Practical advice from those experienced in the formation of land conservation partnerships supports this point, although it tends to emphasize the development of "trust," unlike much of the theoretical literature. *Compare* AXELROD, *supra* at 182 (asserting trust is not needed for the evolution of cooperation among self-interested individuals) *with* Charles F. Sabel, *Studied Trust: Building New Forms of Cooperation in a Volatile Economy*, 46 HUM. REL. 1133, 1137-44 (1993) (rejecting the narrow view of human nature characteristic of rational-choice social theory and neoclassical economics, and examining the erosion of boundaries among communities and organizations through development of trust relationships). For example, Robert Bendick offers the following observations about state government participation in partnership arrangements:

> There has been an alarming turnover in senior state environmental officials in recent years. Personal relationships are critical to the success of partnerships. Both on Block Island and in Jamestown, the key people involved on the public and nonprofit sides worked together closely for ten years. The familiarity and trust that developed over time made it easy to move quickly and efficiently . . . . It is important that agency workers at the civil service level be brought into this process so that as agency heads change, the partnership relationships can continue.

Robert L. Bendick, Jr., *State Partnerships to Preserve Open Space: Lessons from Rhode Island and New York*, *in* LAND CONSERVATION, *supra* note 152, at 149, 164-65.

Northern Forest Lands Council's final report endorses protection of the ecological integrity of the forest, and it urges the states to pursue future opportunities for collaboration, but the potential elaboration of institutional arrangements is left to other forums.[185] Whether the Council's work accomplished important steps in a longer process of institution-building remains to be seen.

Ecosystem management partnership endeavors in general emphasize the need for "win-win" solutions.[186] Inherent in the idea of a partnership is the notion that none of the participants has the authority to override the others unilaterally, and that joint action will occur through identification of shared aims and through bargaining. The Northern Forest Lands Council was a forum premised on such ideas, in which action was by consensus, and no participant could claim hierarchical authority.

Given the Council's mandate and membership, it is not surprising that its recommendations went no further than they did. Consensus and new institutions do not just "happen." Existing laws establishing property rights, taxes, and subsidies, and government regulatory authority all affect the participants' assessment of their current situation and the costs or benefits of proposed collaborations. Bargaining occurs in the context of existing incentives and requirements, and the parties' ability to reach cooperative solutions will depend on their evaluation of outcomes.[187]

Governments, consequently, are more than just "equal partners" in partnership negotiations. As in the Northern Forest proceedings, a government agency may appear in a given setting as just one actor among many, tailoring the exercise of

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185. *See* COMMON GROUND, *supra* note 9.

186. *E.g.*, LONG & ARNOLD, *supra* note 152, at 30.

187. Melanie J. Rowland, *Bargaining for Life: Protecting Biodiversity Through Mediated Agreements*, 22 ENVTL. L. 503, 520-21 (1992). Similar observations have been made about the analogous bargaining among parties that occurs in the context of regulatory negotiation. *See* Susan Rose-Ackerman, *Consensus Versus Incentives: A Skeptical Look at Regulatory Negotiation*, 43 DUKE L.J. 1206, 1208-10 (1994); William Funk, *When Smoke Gets in Your Eyes: Regulatory Negotiation and the Public Interest—EPA's Woodstove Standards*, 18 ENVTL. L. 55, 89-96 (1987) (questioning the use of bargaining to achieve public purposes in regulatory negotiations); *see also* Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 YALE L.J. 950, 966-73 (1979) (discussing the dynamics of bargaining in the context of divorce settlement negotiations); Fiss, *supra* note 180, at 1088 (noting that negotiated settlements may fail to serve the public interest).

administrative discretion under existing law to partnership purposes. But we cannot ignore the larger role of government authorities in establishing conditions under which partnership negotiations occur, and in exercising regulatory authority outside the framework of the negotiations.[188] Admittedly, in setting the stage for the creation of partnerships, governments do not engage in the direct efforts to control outcomes that characterize command-and-control regulatory systems, nor do they dictate the decision-making framework, as in a tradable permit system, where the formulation of goals is tightly controlled in a centralized way although the process of making day-to-day adjustments is not. In a partnership context, the very creation of the institutional regime occurs through decentralized bargaining. Nevertheless, laws developed outside of the partnership arena, and positions asserted by government agencies within the forum of the partnership concerning intended governmental actions, affect the partners' negotiating positions and the availability of means for enforcing adherence to the partnership regime once it is negotiated.[189]

Unfortunately the allocations and definitions of authority under existing law do not altogether support the pursuit of biological diversity and the protection of ecosystem functions. Property rights and the structure of incentives have been largely defined to foster realization of commodity values through a global economy.[190] The general mission of economic development has been circumscribed by existing regulatory and subsidy programs, and tempered by tax structures that encourage the activities of nonprofit organizations, but these programs do not undo the underlying structure.

The redefinition of property rights, the exercise of new regulatory authority, the grant of significant incentives to landowners, or more indirectly, the expansion of the authority and resources of nonprofit organizations, could all contribute to a likelihood of success in establishing ecosystem management regimes through partnership agreements. In any case, a strong

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188. Stewart, *supra* note 167, at 88; Philip Selznick, *Self-Regulation and the Theory of Institutions*, *in* ENVIRONMENTAL LAW AND ECOLOGICAL RESPONSIBILITY, *supra* note 141, at 395, 395 ("[T]he quest for appropriate *external* regulation is not abandoned. On the contrary, the question is what form it should take and what its limits should be.").

189. OSTROM, *supra* note 77, at 212-13; Sabel, *supra* note 184, at 1164-66 (discussing the role of government in setting the conditions that foster new forms of collaboration).

190. *See supra* notes 72-73.

sense of substantive purpose and attention to institutional design are needed to set the context within which partnership negotiations take place.

The circumstances in which successful partnerships have emerged, or where they appear to be underway, provide useful illustrations of this point. These are often situations in which a fear of government-imposed solutions to environmental problems leads to a search for negotiated answers that are less costly to the participants. The specter of measures under the Endangered Species Act, for example, has formed a backdrop for some of the most prominent and ambitious of the ecosystem management partnerships to date.[191] This is not to suggest that partnerships arise only when the parties are on the verge of litigation, but rather, that clear government articulation of substantive purposes involving non-commodity values and a meaningful assertion of the responsibility of individual parties to participate in attaining them are often necessary to galvanize a revised perception of benefits and costs of collaboration, setting the stage for negotiation of an ecologically-coordinated regime. Without a sense of purpose and responsibility, processes that provide for an exchange of views may be little more than procedures to confirm the status quo without developing the means for new forms of decision-making.

Does this mean that ecosystem management will in fact occur only under the "sledgehammer"[192] of centralized regulation such as the Endangered Species Act, making the voluntariness of collaborative self-organization an illusion? The literature on "responsive," "reflexive," and "reconstitutive" law suggests other

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191. Tarlock, *supra* note 63, at 569-74, 604-13; TIMOTHY BEATLEY, HABITAT CONSERVATION PLANNING: ENDANGERED SPECIES AND URBAN GROWTH 19-21 (1994) (discussing specific examples of "habitat conservation planning" in connection with the administration of section 10 of the Endangered Species Act, 16 U.S.C. § 1539 (1988)). The scope of the government's authority to require habitat conservation measures on private property is the subject of litigation, however. *See* Sweet Home Chapter of Communities for a Great Oregon v. Babbitt, 17 F.3d 1463 (D.C. Cir. 1994), *rehearing and rehearing en banc denied*, 30 F.3d 190 (D.C. Cir. 1994), *cert. granted sub. nom. Babbit v. Sweet Home Chapter*, 63 U.S.L.W. 3513 (U.S. Jan. 6, 1995) (No. 94-859). Moreover, even the negotiated plans reached under the Endangered Species Act have been criticized as inadequate to protect species and ecosystems. *See* Houck, *supra* note 91, at 351-58.

192. The term is Jim Huffman's. James L. Huffman, Remarks at the *Vermont Law Review* Symposium on the Northern Forest Lands (Sept. 30, 1994); but see Houck, *supra* note 91, at 278 (denying the accuracy of such characterizations of the Endangered Species Act).

possibilities.[193] The proponents of responsive regulation and its variants advocate systems in which the setting of a broad standard or purpose is coupled with processes for central government agencies to interact with multiple decentralized decision-makers who otherwise exercise broad discretion in establishing immediate goals and developing the institutional means for achieving them.[194]

Some writers have argued that in a system of responsive regulation, central authorities may need to fall back on powers to impose requirements directly when decentralized decision-making fails; otherwise, the sense of direction informed by the substantive goals will be lost, and the system may bring no more than a sparring among narrow interests.[195] At the same time, though, the envisioned institutional design is quite different from a system that relies primarily on centralized regulation, since it defers largely to decentralized decision-making by smaller organizations within broad guidelines, and contemplates the feedback of information and the possibility of mutual adjustments among the different institutional levels over time.

These are attractive ideas that also pose potential dangers. The notion of maintaining a general sense of central direction while fostering semi-autonomous decision-making by complexly-

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193. ENVIRONMENTAL LAW AND ECOLOGICAL RESPONSIBILITY, *supra* note 141; IAN AYRES & JOHN BRAITHWAITE, RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE (1992); Stewart, *supra* note 167, at 92, 104-11; Richard B. Stewart, *Beyond Delegation Doctrine*, 36 AM. U. L. REV. 323, 335-42 (1987); PHILIPPE NONET & PHILIP SELZNICK, LAW AND SOCIETY IN TRANSITION: TOWARD RESPONSIVE LAW (1978); Brooks, *supra* note 100; Gunther Teubner, *Substantive and Reflexive Elements in Modern Law*, 17 LAW & SOC'Y REV. 239 (1983). There are differing views among these various writers, not addressed in this article, that do not affect the implications for the main points discussed here. *See also* Michael Herz, *Parallel Universes: NEPA Lessons for the New Property*, 93 COLUM. L. REV. 1668 (1993) (applying responsive law concepts).

194. Such proposals thus seek to avoid imposing clearcut, substantive rules through centralized fiat. They emphasize instead the development of procedures governing interactions among parties; the purpose may be stated in advance only in broad terms, without establishing the means for direct implementation or enforcement. *See* Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577 (1988) (discussing the use of "crystal" and "mud" rules, and their effect in ongoing relationships among parties); Kathleen M. Sullivan, *Foreword: The Justices of Rules and Standards*, 106 HARV. L. REV. 22, 57-69 (1992) (distinguishing "rules" from "standards").

195. AYRES & BRAITHWAITE, *supra* note 193, at 35-53. *See also* Maarten A. Hajer, *"Verinnerlijking": The Limits to a Positive Management Approach*, *in* ENVIRONMENTAL LAW AND ECOLOGICAL RESPONSIBILITY, *supra* note 141, at 167, 179-82; NONET & SELZNICK, *supra* note 193, at 101-03, Stewart, *supra* note 167, at 92-93, 111-14 (noting the dangers that such systems may be dominated by narrow interests).

nested subsystems fits well with the nature of the ecological task, which demands both a high degree of coordination and a high degree of diversity and local innovation. At the same time, though, the difficulties will undoubtedly lie in maintaining an orientation toward ecosystem protection that is both sufficiently general and open to discussion, and sufficiently measurable and clear to enforce. Certainly the hope would be that an ongoing, mutually adjusting process of interaction among different levels of organization might offer the institutional framework for decision-making that is both centrally coordinated and locally invented. Perhaps future developments in the Northern Forest will provide the opportunity for assessing the workability of such arrangements.

CONCLUSION

Advances in the understanding of biological diversity and ecosystem functions have led to a search for new forms of collective decision-making that can transcend existing jurisdictional boundaries, adapt flexibly to new information, and integrate human economic needs with fundamental ecosystem constraints. Standard centralized approaches to land conservation and environmental protection do not readily provide the means for tackling these issues in an integrated fashion. Acknowledging the need for new approaches to the management of ecosystems, policy-makers have increasingly advocated the formation of ecosystem-based partnerships. Partnership arrangements involve decentralized self-organization by groups that individually hold fragmented authority or influence over aspects of ecosystems under existing law. These arrangements are correctly depicted as a hybrid approach. They rely on both private rights and public authority to define and support an ecosystem-based decision-making community.

The question remains whether such partnerships can plausibly offer an answer to the need for ecosystem management on a widespread basis. One endeavor to organize collaboratively along these lines, the Northern Forest proceedings successfully achieved a statement of goals emphasizing protection of biological diversity and sustainable development. But although the proceedings laid some groundwork for further action at the state and federal government levels, they fell short of establishing or recommending a new ecosystem-based decision-making regime.

A comparison with other ecosystem management efforts and a consideration of the framework within which joint endeavors have occurred highlight the important constitutive role that government plays, even when the aim is to develop cooperative solutions through decentralized decision-making. Stronger national and state government leadership will be needed to foster the conditions under which collaborative ecosystem management systems can readily develop for the Northern Forest and other areas in predominantly private ownership.