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Institutional and legal barriers to ecosystem management

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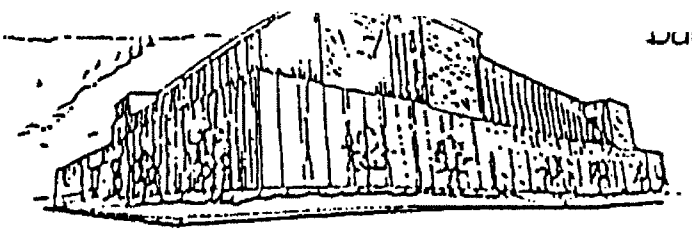

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INSTITUTIONAL AND LEGAL BARRIERS TO ECOSYSTEM MANAGEMENT

by:

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Institutional and Legal Barriers to Ecosystem Management

Director: Stephen Siebert SFS

Recent conceptions of ecosystem management include both ecological and human components. Although natural resource professionals recognize the inherent difficulty in balancing environmental preservation with human development, none have gathered together the many specific barriers that must be overcome to successfully implement ecosystem management. Through interviews with 54 resource professionals including Forest Service Regional Social Science Coordinators, General Counsels, Regional and forest-level Ecosystem Management Coordinators, Forest Supervisors, District Rangers, BLM planners, NGOs, and private industry executives, this paper identifies twenty barriers to implementing ecosystem management.

Among others, the major institutional and legal barriers include the uncertainty of ecosystem management, the Federal Advisory Committee Act (FACA); artificial political boundaries and lack of interorganizational coordination; a perceived threat to private interests; institutional culture, attitudes, and structure; responding to multiple publics, the Endangered Species Act, the National Environmental Policy Act (NEPA), and the National Forest Management Act (NFMA). The list of barriers identified in this paper is not intended to be exhaustive. The list does, however, identify and organize some pervasive roadblocks to implementing ecosystem management. Although brief recommendations are offered to address the barriers, each of the barriers identified calls for a full-scale scientific and legal analysis.

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I. INTRODUCTION

The concept of ecosystem management has infused the natural resource professional community with optimism about the future of land management. Groups that traditionally disagree -- non-profit environmental groups (NGOs) and private industry, the Forest Service and the Park Service -- are each hopeful that ecosystem management will provide a framework to make sense of a complex web of interrelated natural resources issues. The broad appeal of ecosystem management lies in its holistic approach which considers both whole ecological units and human influences, encourages collaboration, and plans for the immediate and the distant future.

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*The author gratefully acknowledges Drs. John Fremouth, Errol Meidinger, Deborah Musiker, Margaret Shannon and Bruce Shindler for their thoughtful reviews of an earlier draft of this manuscript.

This paper focuses specifically on the legal and institutional barriers that natural resource professionals must overcome to successfully implement ecosystem management. The paper has two objectives, which were formulated in relation to the expressed needs of the Eastside Ecosystem Management Project:

> (1) to identify perceived legal and institutional barriers to ecosystem management as conceptualized by natural resource managers and professionals struggling with its implementation, and
>
> (2) to provide a brief analysis of the related literature regarding the barriers those professionals identified.

Time constraints did not allow a scientific sampling of professionals and the author does not suggest that the barriers reported here are exhaustive. A survey of a different mix of resource professionals or a survey of the general public might produce a different collection of barriers. However, the professionals surveyed here are intimately involved in implementing ecosystem management on a daily basis. Therefore, the barriers identified provide a valuable road map for further study.

The barriers discussed here were identified through interviews with 54 resource professionals including Forest Service Regional Social Science Coordinators, General Counsels, Regional and forest-level Ecosystem Management Coordinators, Forest Supervisors, District Rangers, Bureau of Land Management (BLM) planners, NGOs, and private industry executives. The perspectives of these offices were chosen with the hope of identifying the types of barriers being confronted by resource management professionals who have varying degrees of association with implementing ecosystem management. The interviewees were asked to identify the most dominant legal or institutional barriers to involving people in ecosystem management; to rank the importance of the barriers; and to suggest actions to remove or overcome the barriers. For organizational reasons, the barriers are reported in a descending ranked order, depending on how frequently they were mentioned. The author concedes that another sample of professionals may have placed the barriers in a different order but feels all of the barriers identified should be considered significant and worthy of continued discussion. I am grateful to all of the interviewees for their time and insights.

The paper is organized into three sections: Section II illustrates how recent conceptions of ecosystem management include human factors; Section III analyzes the

twenty barriers identified by the respondents in order from most mentioned to least mentioned; and, Section IV offers some brief recommendations to overcome the barriers based on the responses. The intent of this analysis is not to comprehensively solve these problems -- full analysis of each barrier could easily require dozens of pages -- but to identify and organize the pervasive roadblocks to implementing ecosystem management in a cohesive manner and suggest areas for further study.

II. RECENT CONCEPTIONS OF ECOSYSTEM MANAGEMENT

All recent attempts to define ecosystem management struggle to strike an appropriate balance between ecological and human elements. The ecosystem management concept was specifically endorsed by former Forest Service Chief Dale Robertson's June 4, 1992 policy statement: "the Forest Service is committed to using an ecological approach in the future management of the National Forests and Grasslands."[1] Former Chief Robertson's statement recognizes the socio-political basis of ecosystem management by listing "three very important points that must be carried forth to make ecosystem management successful."[2]

> These are: (1) public involvement; (2) the development of "conservation partnerships . . . with State and local governments, the private sector, conservation organizations, and anyone else who has a shared interest in the National Forests and Grasslands;" and (3) "land manager/scientist partnerships."[3]

These three points all relate to the policy issues of improved communication and collaborative decision-making approaches, not scientific management.[4]

Scientists' definitions of ecosystem management incorporate human components to varying degrees. The ecosystem approach to managing natural resources formulated by

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[1]Robertson, D. *Ecosystem Management of the National Forests and Grasslands.* Memorandum to Regional Foresters and Station Directors, USDA Forest Service, June 4, 1992.

[2]Cortner, H.J. and M.A. Moote. *Sustainability and Ecosystem Management Forces Shaping Political Agendas and Public Policy.* A paper presented at the S.A.F. National Convention, Richmond, VA on October 24-28, 1992.

[3]Robertson, *supra* note 1, at 1-2.

[4]Cortner and Moote, *supra* note 2, at 310; *citing* Robertson, *supra* note 1, at 2.

Slocombe (1993) defines the goal of ecosystem-based management as providing "a framework and a research agenda that will facilitate the joint achievement of environmental protection and economic development through modified planning, management policy, and decision-making activities."[5] Lewis (1993) begins his analysis of ecosystem management with the assumption "that human societies are embedded within, and at the same time, interact with the natural world."[6] After completing an extensive literature review, Grumbine (1994) formulated the following working definition: "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."[7] Each of these definitions struggles to balance competing concerns: preservation and development, ecology and economics, science and values.

Slocombe (1993) offered the following synthesis of the main components of an ecosystem approach:

- describe parts, systems, environments, and their interactions, are holistic, comprehensive, and transdisciplinary,
- **include people and their activities in the ecosystem,**
- describe system dynamics through concepts such as stability and feedback,
- define the ecosystem naturally, for example, bioregionally instead of arbitrarily,
- look at different levels and/or scales of system structure, process, and function,
- recognize goals and take an active, management orientation,
- **incorporate stakeholder and institutional factors in the analysis,**
- **use an anticipatory, flexible research and planning process,**
- entail an ethics of quality, well-being, and integrity, and
- recognize systemic limits to action - defining and seeking sustainability.[8]

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[5]Slocombe, D.S. *Implementing Ecosystem-based Management: Development of theory, practice, and research for planning and managing a region.* 42 BIOSCIENCE 612, 612 (1993).

[6]Lewis, B.J. *Problem Analysis: The Social Dimension of Ecosystem Management.* A paper prepared for the Social and Economic Dimensions of Ecosystem Management Project, USDA Forest Service, North Central Forest Experiment Station, p. 20 (October 1993).

[7]Grumbine, R.E. *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 31 (March 1994).

[8]Slocombe, *supra* note 5, at 617.

As outlined in bold, ecosystem-based planning efforts embrace human values and public participation, but fail to include mechanisms to overcome institutional or legal barriers to this human involvement.

The complexity of the institutional and legal barriers has been partially created by the entangled public land historical context from which the ecosystem management concept evolved. Successful ecosystem management must muddle through a haphazardly developed morass of public land laws and the functional, target-oriented institutional culture that they fostered. Federal public land law has tended to reinforce hard and fast politically-drawn boundary lines that usually have little in common with the often shifting ecological boundaries of dynamic ecosystems.[9] The public land agencies each are constrained by their different organic act mandates and relevant environmental laws in attempting to coordinate management of land areas separated by these political boundary determinations rather than ecological ones. Keiter (1988) observes that organic laws regarding national park and wilderness management are in tension with multiple-use mandates regarding adjacent federal lands.[10]

Conflicts have steadily increased between development and preservation interests on the multiple use lands. The existing legal framework does not specifically endorse ecosystem management. Agency cultures, partially spawned by this piecemeal legal set-up, frequently conflict with interagency coordination and ecosystem management principles. The multiple use mandates are confusing at best and do not provide direction or a strong legal springboard for ecosystem management. To enable ecosystem management to flourish, natural resource managers, NGOs, and the general public must minimize the barriers identified below.

III. BARRIERS TO ECOSYSTEM MANAGEMENT

Twenty barriers were identified through interviews with 54 natural resource professionals The results are listed in Table 1. Each barrier will be addressed in order beginning with the most often mentioned and proceeding to the least often mentioned.

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[9]Sax, J.L. and Keiter, R.B. *Glacier National Park and Its Neighbors: A Study of Federal Interagency Relations.* 14 ECOLOGY LAW QUARTERLY 207 (1987).

[10]Keiter, Robert B. *Natural Management in Park and Wilderness Areas: Looking at the Law.* In: Ecosystem Management for Parks and Wilderness. Seattle, University of Washington Press. p. 15, 36 (1988).

TABLE 1. Barriers to ecosystem management in rank order. Results of informal interviews with 54 resource management professionals. 1994.

Barrier	Number of respondents mentioning the barrier	Percentage of total respondents
1. Uncertainty of ecosystem mgmt. (e.m.)	34	63%
2. FACA	25	46
3. Interorganizational coordination	24	44
4. Perceived threat to private interests	16	30
5. Institutional culture	16	30
6. Institutional attitudes	14	26
7. Institutional structure	14	26
8. Multiple publics	14	26
9. Budget structure	13	24
10. Building public interest in e.m.	10	19
11. Scattered land ownership patterns	8	15
12. Endangered Species Act	7	13
13. NEPA	6	11
14. Time frames	6	11
15. Managing expectations	5	9
16. NFMA	4	7
17. Conflicting organic mandates	3	6
18. Monitoring	3	6
19. Air and water quality laws	2	4
20. Constraints of state law	2	4

1. Uncertainty of Ecosystem Management

The most often mentioned barrier to implementing ecosystem management, identified by nearly two-thirds of respondents (63%), was confusion about the ecosystem management concept. That uncertainty is expressed in two forms: (1) uncertainty about the definition of ecosystem management, and (2) uncertainty regarding management direction, commitment and leadership in respect to ecosystem management.

a. Uncertainty about the definition of ecosystem management

Agency officials at all levels thought that ecosystem management stills lacks a precise definition, while both NGO and private industry respondents were uncertain of its meaning altogether. Two District Rangers thought that the plethora of academic and

Washington Office/Regional level definitions have created total confusion at the local level. Two other respondents, a Forest Supervisor and a forest-level Ecosystem Management Coordinator, thought there was a clear lack of consensus within the agency regarding its meaning. One Forest Service Regional Social Scientist thought that the difficulty in defining the concept stemmed from the different management traditions and missions of the agencies as dictated by their organic acts. He thought the distinct viewpoints and responsibilities of the authoring agencies have contributed to the development of different ecosystem management definitions.

Analysts generally concur that confusion surrounds ecosystem management's definition. Agee and Johnson (1988) note that ecosystem management is not yet a clearly defined concept.[11] Slocombe (1993) found that critics commonly criticize the way ecosystem is defined, claiming that the methodology relies too much on analogy and comparison, is too broadly applicable, and overlaps or duplicates methods and work proper to other, specialized disciplines.[12] Keiter (1994) thinks that the lack of a precise definition is due to the newness of the concept, the continuing uncertainties accompanying the underlying science, and the bureaucracy's inherent resistance to change.[13]

Analysts generally credit the underlying scientific concepts with contributing to the ambiguity of ecosystem management definitions. Scientists generally include such terms as dynamic, complex, changing, interrelated and unstable in their definitions of ecosystems.[14] Defining ecosystem boundaries in a dynamic world is at best an inexact art.[15] These concepts do not translate easily into firm, legal definitions. Ecosystem approaches mean different things to different people and different disciplines.[16] Although some scientists believe this variety is a strength, overall it has probably neither increased the use nor the scientific respectability of ecosystem approaches.[17] Much of the "fuzziness" or lack of precision surrounding ecosystem management derives from alternative viewpoints

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[11] Agee, J.K. and D.R. Johnson. *A Direction for Ecosystem Management.* In: Ecosystem Management for Parks and Wilderness, Seattle, University of Washington Press, p. 226 (1988).

[12] Slocombe, *supra* note 5, at 617.

[13] Keiter, R.B. *Beyond the Boundary Line: Constructing a Law of Ecosystem Management.* 65 U. COLO. L. REV. 293 (1994).

[14] *See generally* Agee and Johnson, *supra* note 11; Slocombe, *supra* note 5.

[15] Grumbine, *supra* note 7, at 29; *see also* Agee and Johnson, *supra* note 11.

[16] Slocombe, D.S. *Environmental Planning, Ecosystem Science, and Ecosystem Approaches for Integrating Environment and Development,* 17 ENVIRONMENTAL MGMT. 289, 296 (1993).

[17] *Id.*

regarding the integration of protecting ecological integrity with providing human goods and services.[18]

b. Uncertainty regarding management direction, commitment and leadership

Uncertainty regarding the public agencies' management direction and commitment to ecosystem management permeated the survey responses. A common theme among the Forest Service respondents was that ecosystem management decisions are not well-communicated among the different levels of the agency. Coordinators of ecosystem management at both the regional and forest levels were particularly concerned about the confusion among Forest Service employees regarding the meaning of ecosystem management and how to translate it into action on the ground. Four respondents noted the inconsistent levels of commitment and implementation of ecosystem management throughout the agencies (both between different forests and districts; between upper- and lower-level management, and between the Forest Service and BLM). Three respondents commented that while upper management may have a clearer idea of ecosystem management, that message is not being well-communicated from the upper to lower ranks. District Rangers noted that without clear direction from upper management, many employees have adopted a "wait and see" attitude. The lower level agency employees are simply not internalizing the changes in management philosophy. Some employees wonder whether ecosystem management is just a passing fad.

Another common theme among respondents was a perceived institutional lack of direction and commitment to ecosystem management. A dozen respondents indicated a need for bold leadership with a clear mission dictated from upper management. Half of them suggested that the uncertainty about who was in charge of ecosystem management throughout the ranks of the agency had to be addressed. Boyle and Shannon (1994) concluded that successful collaborative efforts always have a strong leader:

> A successful collaborative or interdisciplinary effort is always guided by clear direction, a willingness to advise and counsel, and finally, by a timely and unambiguous decision.[19]

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[18]Grumbine, *supra* note 7, at 31.

[19]Boyle, B.J. and M.A. Shannon et al. *Policies and Mythologies of the U.S. Forest Service: A Conversation with Employees*, p. 5 (1994).

All respondents who identified a leadership barrier felt that Forest Service Chief Jack Ward Thomas had a strong voice and was clearly capable of dictating policy that would lessen the confusion among employees. Four respondents felt strongly that the best way to indicate to lower-level employees the agency's new commitment to ecosystem management was to make a clear break with past management practices. One analyst agrees that termination of existing decision processes is essential before "one can get on with the constitution of new ones."[20]

Respondents from all perspectives mentioned the uncertainty of managing ecosystems as a significant barrier. A common theme among respondents was that, because the field is dynamic and constantly changing, management must be framed as a learning experience for everyone involved. One forest-level Ecosystem Management Coordinator summed up the problem as follows: "the combination of extremely complex science (and ignorance about scientific processes) and human elements coupled with inadequate information on options and programs makes ecosystem management particularly difficult." Resource professionals simply do not know enough about the functioning of many ecosystems to prescribe specific management activities to produce desired functional benefits.[21] One District Ranger worried that the management options are not black and white, but gray, which creates the danger that the process will become forever bogged down while we try to figure out definite answers to uncertain questions.

Three respondents suggested that land managers must design flexible policies that accommodate changing public perceptions because of the uncertain nature of ecosystems themselves. Forestry training programs must "emphasize the management of uncertainty as a basic element of forestry (rather than assume it away), with ecological resilience, socioeconomic consequences and scale effects being crucial variables in decision-making."[22] The dynamic nature of ecosystems prevents application of a general scientific

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[20]Brewer, G.D. *Ecosystem Management: Challenges of Formulation and Implementation*. Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 139, 140-43 (November 19-21, 1991).

[21]Roberts, D. *Management of Ecosystem Structure and Function: Problems and Progress in Understanding*. Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 73, 78 (November 19-21, 1991).

[22]Machlis, G.E. *The Social Context of New Perspectives*. A paper presented at the Southern New Mexico New Perspectives/Centennial Celebration, Las Cruces, New Mexico, p. 26, 32 (November 7-9, 1991).

formula: maintenance will vary site-by-site and species-by-species, and change over time.[23]

2. The Federal Advisory Committee Act (FACA)

The Federal Advisory Committee Act (FACA) was the most commonly mentioned legal barrier to involving humans in ecosystem management and the second most mentioned barrier overall. Forty-six percent of respondents considered FACA a barrier. All of the Forest Service Office of General Counsel attorneys (OGCs) who mentioned FACA considered it the most significant barrier. The respondents' greatest concern was that the fear of violating FACA has created a chilling effect on public participation. A Forest Service Regional Social Science Coordinator concluded that the adverse court ruling[24] regarding FEMAT's timber industry challenge to President Clinton's forest plan caused tremendous disarray in the Forest Service administration and OGC offices. Agency staff already engaged in public participation are canceling meetings to avoid FACA violations. Managers worry that time spent on issues now will be worthless later when disgruntled parties discover that non-federal sources were part of the agencies' decision teams. Both BLM and Forest Service ecosystem coordinators felt that FACA is preventing public agencies from assuming a leadership role in the collaborative processes considered essential for successful ecosystem management. Also, three managers believed that achieving effective public participation is impossible when non-federal parties are excluded from all decisionmaking roles.

In contrast, a few respondents (7%) specifically said FACA was not a barrier to ecosystem management. In addition, a significant percentage of the managers who mentioned FACA (an additional 16%) considered it a barrier, but certainly not an insurmountable one. They thought the perception of a FACA problem was much bigger than the actual problem. They felt confident that the problem would be worked out soon because the original purposes of FACA are not being served by preventing public participation here.

Nearly all respondents, however, were unclear about what types of public contact were and were not allowed under FACA. In response to these concerns and the confusion

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[23]Keiter, R.B. *Taking Account of the Ecosystem on the Public Domain: Law and Ecology in the Greater Yellowstone Region.* 60 U. COLO. L. REV. 923, 932 (1989).
[24]Northwest Forest Resource Council v. Espy, Civ# 93-1621 (D. D.C. 1994).

regarding FACA's chilling effect on public participation, the following subsections briefly discuss key FACA statutory and regulatory provisions, and court rulings interpreting them.

a. Purpose of FACA

The advisory committee issue dates back to the 1950s when the Justice Department set forth published guidelines to prevent any violation of the antitrust laws when industry leaders were brought together with government approval.[25] A primary Congressionally declared purpose of FACA is "... to assure balance and objectivity in the membership of ... advisory committees."[26] Essentially, FACA was enacted to guard against unfair industry influence over government advisory committees.

FACA's prior legislative history and subsequent court interpretations more clearly indicate the Act's purpose. "The legislative history indicates that the Act was intended to make the operations of advisory committees more open and, by such means as requiring 'fairly balanced' membership, to remedy the problem of special interests using advisory committees to advance their own objectives."[27] FACA's focus on preventing biased, self-serving committees has been clarified by various court decisions: (a) the purpose of FACA is "to control the advisory committee process and to open to public scrutiny the manner in which government agencies obtain advice from private individuals and groups;"[28] (b) "to eliminate useless advisory committees, strengthen independence of remaining advisory committees, and prevent advisory groups from becoming self-serving;"[29] (c) "to increase the public accountability of advisory committees established by the Executive Branch and to reduce wasteful expenditures on them;"[30] (d) "to cure specific ills, above all the wasteful

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[25]Public Citizen v. U.S. Department of Justice, 105 L.Ed.2d 377 (1989) (provides history of advisory committee issue).

[26]7 U.S.C. § 2281 (1988).

[27]Marblestone, D.B. *The Coverage of the Federal Advisory Committee Act*, 35 FED. BAR J. 119, 126 (1976). For example, the 1972 House Report contained the following statement: "One of the greatest dangers in the unregulated use of advisory committees is that special interest groups may use their membership on such bodies to promote their private concerns." 118 Cong. Rec. 16296, 16302 (1972); *see also* 1972 House Report 16306 and similar statements in Senate Report.

[28]Washington Legal Foundation v. American Bar Ass'n Standing Committee on Federal Judiciary, 648 F. Supp. 1353, 1358 (D. D.C. 1986).

[29]Consumers Union of U.S., Inc. v. Department of Health, Ed. and Welfare, 409 F. Supp. 473, 475 (D. D.C. 1976), *aff'd* 551 F.2d 466.

[30]Public Citizen, 105 L.Ed.2d at 394.

expenditure of public funds for worthless committee meetings and biased proposals. . . ."[31] A July 12, 1994 letter from Forest Service Chief Jack Ward Thomas explained FACA's purpose as follows: "The Federal Advisory Committee Act (FACA) was designed to 'help level the playing field,' to keep individuals or groups from getting special treatment from the Federal government, and to help ensure equal access for all."[32]

b. What is an advisory committee?

FACA imposes regulations on advisory committees used by the President and federal agencies to obtain advice and recommendations. FACA defines "advisory committee" as any "committee, council, conference, panel, task force, or other similar group" which is:

> (1) established by statute,
> (2) established or utilized by the President, or
> (3) established or utilized by any agency official to obtain advice or recommendations. . . .[33]

The definition highlights four parameters of any advisory committee: (1) a *group* of knowledgeable persons, (2) assembled for a *specific purpose*, (3) *utilized* by the Executive branch, (4) that *renders advice* or recommendations. Only exceptions in the statute, discussed later in this section, exempt a group that fits these parameters.

A committee need not be created by the President, Congress (i.e. by statute) or by an agency to fall under FACA's jurisdiction. An outside or existing group may be considered an advisory committee under FACA if it is "utilized by" the Executive branch in an advisory capacity. The legislative history of the Act does not clarify the meaning of the phrase "utilized by,"[34] but FACA regulations define "utilized (or used)" as adopting the advice of a non-Federal group (i.e. through institutional arrangement) "as a preferred

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[31] *Id.* at 391.

[32] Thomas, J.W. *Federal Advisory Committee Act (FACA).* Memorandum to Regional Foresters, Station Directors, Area Director, IITF Director, WO Staff Directors; USDA Forest Service, July 12, 1994.

[33] 7 U.S.C. § 2282(3) (1988); 5 U.S.C. App. 2 § 3(2); 41 C.F.R. § 105-54.102 (1993); 41 C.F.R. § 101-6.1003 (1993); DR 1041-1 § 4b (Feb. 8, 1993); Forest Service Manual 1350.5(2).

[34] Consumers Union, 409 F. Supp. at 475.

source . . . in the same manner as . . . from an established advisory committee."[35] For example, in *Public Citizen v. United States Dept. of Justice*, the Supreme Court held that FACA did not apply to the "special advisory relationship" between the President and the American Bar Association Standing Committee on Federal Judiciary on matters of judicial nomination. The ABA group was not a "utilized" committee within the meaning intended by Congress and therefore the ABA committee did not fall under the statutory definition of "advisory committee."[36] Thus, circumstances surrounding the actions of a group, rather than its official capacity, determine the applicability of FACA.

The scope of FACA is not restricted merely to groups *formally* designated as advisory committees.[37] The question of applicability of the Act depends on the nature and substance of the relationship between the non-federal group and the federal agency. Application of FACA depends on the "totality of the circumstances" or specific facts of the situation. Factors include: the purpose of any meeting, who attends, whether consensus is an objective or result, frequency of meetings, and the rotation of individual membership.

c. Regulations relevant to ecosystem management

Several of FACA's regulatory provisions contain specific requirements that could impact public participation in an ecosystem management context. Since coverage under FACA is fact specific, case law, rather than regulatory interpretation, is the most reliable indicator of the Act's applicability. Unfortunately, FACA enforcement is relatively new in the natural resources arena and has only been applied to a few specific fact situations. Therefore, the predictability of future FACA-related violations regarding ecosystem management collaboration is fairly poor. This low level of legal predictability has contributed to the frustration felt by natural resource managers actively engaged in public participation. This subsection briefly outlines some of that difficult legal precedent.

Generally, FACA prohibits non-federal members of an advisory committee from participating in the *decisionmaking process* of an advisory committee. Decisions on the expenditure of Federal money and the adoption of Federal policies, programs, plans, and projects must be made by *federal officials*. When these decisions are made by a *group* of individuals including both federal and non-federal members, or by federal officials "utilizing" such a group, the group may be an "advisory committee" that comes under the

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[35] 41 C.F.R. § 101-6.1003 (1993).
[36] 491 U.S. 440 (1989).
[37] *See, i.e*, 41 C.F.R. § 101-6.1003 (1993).

requirements of FACA.[38] The recent decision by Judge Jackson declaring the Forest Ecosystem Management Assessment Team (FEMAT) an advisory committee has caused considerable consternation among Forest Service employees currently employing public participation techniques. The District Court, in *Northwest Forest Resource Council v. Espy*,[39] held that FEMAT was an advisory committee in violation of FACA. The court ruled that state university professors were not "full-time federal employees" under FACA even though they were paid by the federal government for several months during their FEMAT participation. Thus, the team, established by the President, included non-federal employees who provided advice and recommendations to federal officials. Since not all committee members were full-time Federal employees, the FEMAT team was required to follow FACA guidelines. The court neglected to decide, however, whether FEMAT's advice could be used in developing regulations to implement the President's Forest Plan. That issue was left for later courts to decide. Currently, there are eight complaints filed for various violations of Federal law by the FEMAT process and the Northwest Record of Decision signed by the Secretaries of Agriculture and the Interior on April 14, 1994.[40] FACA's prohibitions against recurring meetings, consensus advice, and non-federal decisionmaking make consensus building ecosystem management difficult to implement.

FACA prohibits recurring meetings initiated by a group where the group's view is used as a preferred source of advice or recommendations to the federal government.[41] Group meetings must remain open to the public and allow volunteers to attend meetings and otherwise participate.[42] For example, the D.C. Court of Appeals, in *Association of American Physicians and Surgeons, Inc. v. Hillary Rodham Clinton*,[43] held that the President's Task Force on National Health Care Reform was not an advisory committee by defining Mrs. Clinton as a "special government employee" rather than a private citizen. However, an "interdepartmental working group" comprised of federal employees, "special government employees" employed for limited duration, and "consultants" who attended meetings on an intermittent basis might be an advisory committee. The case was remanded to the District Court for additional findings. The court reasoned that "[i]n order to implicate

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[38]Schmidt, O.L. et. al. *Federal Advisory Committee Act White Paper*, Draft 4, USDA Office of General Counsel, Portland, OR, p. 1 (August 27, 1993) (Includes chart regarding groups more and less likely to come under FACA).

[39]Civ# 93-1621 (D. D.C. 1994).

[40]Pending cases that allege FACA violations include: Northwest Forest Resource Council v. Thomas (D. D.C. Civ# 94-1032); Northwest Forest Resource Council v. Dombeck (D. D.C. Civ# 94-1031).

[41]41 C.F.R. § 101-6.1004(j) (1993).

[42]5 U.S.C. App. 2 § 10(a)(1 & 3).

[43]1993 WL 213920, Civil Nos. 93-5086 & 5092 (D.C. Cir., June 22, 1993).

FACA, the President, or his subordinates, must create an advisory group that has, in large measure, an organized structure, a fixed membership, and a specific purpose."[44]

In contrast, groups that do not advise the *federal* government or are employed wholly by private companies do not violate FACA. For example, in *Public Citizen v. Commission on the Bicentennial of U.S. Constitution,*[45] the District Court held that the Commission on the Bicentennial of the United States Constitution was not an advisory committee because the committee did not render advice to the federal government, but made recommendations to state, local and private entities, and was empowered to undertake itself the federal projects which it was to plan. In *Food Chemical News v. Young,*[46] the D.C. Court of Appeals held that a group of experts assembled by a private scientific organization pursuant to its contract with the FDA to provide counsel on food safety and quality issues was not an "advisory committee" subject to the requirements of FACA. The panel was established and utilized by the private organization, not by the FDA, and the organization was a private contractor that did not have quasi-public status. Similarly, in *Consumers Union of U.S., Inc. v. Department of Health, Ed. and Welfare,*[47] the court found an organization representing the cosmetics industry not to be an advisory committee where the organization merely presented an industry-sponsored proposal to the FDA seeking its advice and comments regarding voluntary cosmetics testing programs. Thus, committees that offer advice to state and local governments, or are used by private industry are not required to comply with FACA. However, sometimes the line between federal advice versus state and local advice is quite narrow. The D.C. Court of Appeals, in *Center for Auto Safety v. Cox,*[48] ruled that the American Association of State Highway and Transportation Officials (AASHTO) was an advisory committee where AASHTO provides input to the Federal Highway Administration with respect to proposals to require that state highway construction plans provide for minimum safety standards. The court found that the purpose of AASHTO was to offer advice to the federal government, and thus AASHTO was not exempt from FACA as a committee providing advice to state and local governments.

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[44] *Id.* at 5095.
[45] 622 F. Supp. 753 (D. D.C. 1985).
[46] 900 F.2d 328 (D.C. 1990), *cert. denied* 111 S. Ct. 132.
[47] 409 F. Supp. 473 (D. D.C. 1976), *aff'd* 551 F.2d 466.
[48] 580 F.2d 689 (D.C. 1978).

FACA also prohibits federal officials from initiating meetings with a group to obtain consensus advice or recommendations.[49] Interestingly, in *Lombardo v. Handler*,[50] the District Court found no FACA violation where the Environmental Protection Agency (EPA) contracted with the National Academy of Sciences to convene a panel of experts as long as the panel's recommendations were reviewed by the substantial scientific expertise within the Academy itself first before submission of reports to the EPA. Although the panel consisted of non-federal scientists, it had only one meeting with the EPA and did not work with federal employees toward consensus advice; therefore, the court reasoned that no FACA violation occurred. The District Court came to a consistent conclusion in *Natural Resources Defense Council v. Harrington*,[51] where the Secretary of the Department of Energy convened a panel of scientist-executives to study the safety of a government-owned nuclear reactor in operation in the state of Washington due to a nuclear disaster at a similar power station in the Soviet Union. The court ruled that the panel was not an "advisory committee" because panel members had not been asked to comment upon nuclear power generally or the manner of its regulation, but merely to examine whether government ought to allow a single reactor to continue in operation. The panel members had been directed to work independently and to report alone. So, again the non-federal group did not meet as one body and offer consensus advice or recommendations.

FACA does not apply to groups specifically exempted by an Act of Congress; groups with non-recurring meetings; individual advice, information gathering or fact exchange; or groups composed wholly of full-time federal employees.[52] The exclusion of these non-organized groups is quite narrow.[53] The exclusion applies when the following conditions are met:

> the entire process of the federal official's convening and meeting with the group is informal in nature; the group meets once or perhaps twice; has no continuing function and has no organization; the meeting does not involve substantial, special preparation; the non-government participants act as individuals, i.e., the group as such does not take positions.[54]

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[49]41 C.F.R. § 101-6.1004(i) (1993).
[50]397 F. Supp. 792 (D. D.C. 1975), *aff'd* 546 F.2d 1043 (D.C. 1976), *cert. denied* 431 U.S. 932 (1977).
[51]637 F. Supp. 116 (D. D.C. 1986).
[52]D.R. 1041-1 § 6 (1993).
[53]Marblestone, *supra* note 27, at 128.
[54]*Id.*

Only groups having some sort of established structure and defined purpose constitute "advisory committees." For example, in *Nader v. Baroody*,[55] the District Court held that bi-weekly White House meetings with selected groups including major business organizations and private sector groups do not create advisory committees where the meeting were unstructured, informal, and not conducted for the purpose of obtaining advice on specific subjects indicated in advance. Thus, FACA was not intended to apply to all amorphous, ad hoc group meetings.

To further complicate matters, President Clinton recently issued several Executive Orders to encourage more effective intergovernmental cooperation in developing and implementing Federal regulatory actions.[56] Executive Order 12866 issued September 30, 1993 , entitled "Regulatory Planning and Review," encourages agencies to seek to "harmonize Federal regulatory actions with related State, local, and tribal regulatory and other government functions."[57] Each agency is directed to "explore and, where appropriate, use consensual mechanisms for developing regulations, including negotiated rulemaking."[58] No specific approach for the accomplishment of these goals is required, but the directive states it should be an "effective process" dictated by the order and magnitude of the issues involved.[59]

Executive Order 12875 issued October 26, 1993, entitled "Enhancing the Intergovernmental Partnership," was issued to reduce the imposition of non-statutory unfunded mandates on state, local and tribal governments.[60] The Order directs each agency to establish a meaningful and timely mechanism for consultation with these affected parties in the development of regulatory proposals containing significant non-statutory unfunded mandates.[61] Given all of these conflicting authorities, deciphering whether routine public participation activities constitute a violation of FACA occurs becomes quite difficult. The effect of these recent Executive Orders on public participation in an ecosystem management context is still unclear.

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[55]396 F. Supp. 1231 (D. D.C. 1975).

[56]These Executive Orders are part of the recommendations of the National Performance Review lead by Vice President Gore, coupled with the Administration's efforts to streamline the Executive Branch's regulatory review process and encourage more direct interaction with entities affected by federal policies. Dean, J.L. *Applicability of the Federal Advisory Committee Act (FACA) to Intergovernmental Contacts*; General Services Administration Memorandum For Committee Management Officers, March 21, 1994.

[57]*Id.* at 2.

[58]*Id.*

[59]*Id.*

[60]*Id.*

[61]*Id.*

3. Artificial Political Boundaries Create a Need for Improved Inter-organizational Coordination

a. Artificial political boundaries

A common theme articulated in various ways as a barrier by 44% of the respondents is that artificial political boundaries between the agencies reflect a need for improved inter-organizational coordination. Both BLM managers and USFS District Rangers noted that turf sensitivity among the agencies in a geographic area has created artificial political boundaries between the agencies. "Turf" sensitivity is not unusual within the federal bureaucracy, especially among public land management agencies accustomed to a largely discretionary management style."[62] A Regional Social Science Coordinator thought these sensitivities were the result of each office and its employees working in a vacuum throughout their careers, making exchange of information difficult. Thus, he said there is a provinciality barrier caused by agency personnel viewing problem sets as isolated rather than interwoven. Respondents from both the Forest Service and the BLM commented on the need for offices geographically located upstream and downstream from each other to coordinate activities and exchange information. However, two BLM planners and two Forest Service forest-level Ecosystem Management Coordinators thought that many employees would resist redistributing boundaries along ecosystem lines due to uncertainty about their personal careers. They thought that employees fear their jobs will be eliminated, or their authority and responsibilities decreased. A Regional Social Science Coordinator said that land managers have a vested interest in holding on to their management styles which inhibits cooperation on a broader scale.

Academics agree that ecosystem management is constrained by agencies' boundary mentality which includes interagency mistrust, turf-power consciousness, insular management, and different philosophies.[63] Multiple and conflicting values and objectives are the result of different management philosophies and a lack of a systematic way of defining common goals.[64] The inability to apply management evenly across political boundaries and a lack of cooperation between agencies, organizations and the private sector

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[62]Keiter, R.B., *supra* note 10, at 30-31.
[63]Agee and Johnson, *supra* note 11, at 230.
[64]*Id.*

has erected perceived barriers to ecosystem management.[65] Although fragmentation of authority is a fundamental feature of American government's system of checks and balances that often creates positive results, the resource managers on the ground do not consider fragmentation a benefit. Their attempts to implement ecosystem management have been frustrated by difficulties associated with reaching across these artificial boundaries.

b. Need for improved inter-organizational coordination

A second theme, apparent among both respondents and academics, is that implementing ecosystem management will require improved inter-organizational coordination.[66] Agencies are fragmented and bound by traditional roles and compartmentalized management.[67] Basic differences in mandate, mission, and experience hamper the agencies' ability to examine the cumulative impacts of management practices on resources that cross administrative boundaries.[68] Using ecological boundaries requires cooperation between federal, state, tribal, and local management agencies as well as private parties.[69]

Five respondents, from various levels, commented on the difficulty of bringing all of the significant parties with different interests to the same table. District Rangers and forest-level Ecosystem Management Coordinators said that people are always very busy and they "burn out" quickly with the complicated issues that need to be addressed. Particularly important is the need to get all the "appropriate level" players (i.e. stakeholder groups) to the table at the same time. NGOs, private industry executives, and agency managers were all sensitive about going to a meeting with someone from an organization that is not on their level and cannot make equal concessions and work toward real resolution of relevant issues. Eight respondents commented on the perception among managers and private interests that cooperative planning will limit future options. Cortner and Moote believe that for ecosystem management to work, it may require merging some of

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[65]Fischer, B.C. *Intergovernmental and Public-Private Cooperation.* Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 112 (November 19-21, 1994).

[66]*See, i.e.*, Cortner and Moote, *supra* note 2, at 313.

[67]Clark, T.W. and A.H. Harvey. *The Greater Yellowstone Ecosystem Policy Arena*, 3 SOCIETY AND NATURAL RESOURCES 281, 283 (1990).

[68]Goldstein, B.E. *Can Ecoystem Management Turn an Administrative Patchwork into a Greater Yellowstone Ecosystem?*, 8 NORTHWEST ENV. J. 285, 300 (1992).

[69]Grumbine, *supra* note 7, at 31.

the existing institutions, or at least designation of a lead or "umbrella" agency rather than attempting to coordinate activities among the existing resource management institutions.[70]

Ideally, ecosystem management includes participation of interested and affected parties in a collaborative decisionmaking process.[71] Collaborative decisionmaking, however, may not take into account the basic requirements of agency accountability, stewardship, and representation.[72] Collaborative decisionmaking, especially with so many disparate interests, may not prove truly equitable because it tends to focus on the powerful and organized parties. In the Yellowstone region, Leal (1990) noted that natural resource managers devote too much attention to trying to please the most well-organized groups, rather than the public at large.[73] The process may disenfranchise new constituencies and unborn constituencies.[74] What mechanism will be built into the ecosystem management process to ensure fairness and allow future input? If everyone is part of the decision, is anyone accountable?[75]

4. Perceived Threat to Private Interests

Thirty percent of the respondents identified the perceived threat of "eco-based" management to private interests as a major barrier. BLM planners, ecosystem management coordinators and NGOs in particular, commented on the bias against the term "ecosystem management" because its ecological connotations caused private landowners to fear increased regulations of private land. Conversations with private executives confirmed their perceptions; every private executive expressed concern about a larger, more restrictive government regulation scheme. Private land owners are passionately attached to their lands, want to maintain a legitimate economic return from it, do not want to be patronized, and are worried about a long-term commitment of their land to a big government plan that limits future decisionmaking flexibility.[76] A Regional Social Science Coordinator noted a

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[70]Cortner and Moote, *supra* note 2, at 313.

[71]*See, i.e.*, Slocombe, *supra* note 5, at 617.

[72]Cortner and Moote, *supra* note 2, at 314.

[73]Leal, D. *Saving an Ecosystem: From Buffer Zone to Private Initiative.* In: Baden, J.A. and Leal, D., eds. The Yellowstone Primer: Land and Resource Management in the Greater Yellowstone Ecosystem, San Francisco, Pacific Research Insttute for Public Policy, p. 41-42 (1990).

[74]Cortner and Moote, *supra* note 2, at 314.

[75]*Id.*

[76]*See, i.e.*, Gray, G.J. *Promoting Public Values on Private Forest Lands: Lessons from Forest Stewardship and Forest Legacy.* A paper presented at the

perception among private landowners that big government might try to tell them what to do with their land. For some, ecosystem management "conjures up images of a new, overbearing governmental planning authority, deciding the best use for private as well as public forest lands, and then imposing its will on private owners through regulations and other limitations on land use."[77] The willing participation of private landowners is essential to the success of ecosystem management. Another Regional Social Science Coordinator remarked that the agencies need private cooperation to make landscape-scale management schemes work. He noted the difficulty that proponents of PACFISH[78] are encountering in trying to protect river systems from upper stream reaches all the way to the ocean because of the private lands situated in between. Non-industrial private forest landowners collectively own nearly 60% of U.S. forest land.[79] Cubbage and Siegel (1985) believe that a continued regulatory trend favoring public welfare over individual property rights will continue to spark legal controversy.[80]

An apparent theme in the respondents' comments is that to effectively implement ecosystem management across a landscape, the current debate between private property owners and the public must be diffused. Past attempts at landscape-scale planning support this conclusion. The controversy surrounding the Vision for the Future plan developed by the NPS and USFS to manage the Yellowstone region illustrates the danger of undertaking regional planning without cultivating grass roots support or ensuring the involvement of key political players in the area.[81] Ecosystem management will require some increase in public rights in private property and, conversely, some increase in private rights on public land.[82] Whether these changes are based on government regulation or through innovative,

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Economics, Policy, and Law Working Group session at the Society of American Foresters National Convention, Richmond, VA, p. 340-45 (October 25-28, 1992).

[77]Sample, V.A. *Building Partnerships for Ecosystem Management on Forest and Range Lands of Mixed Ownership.* A paper presented at the Economics, Policy, and Law Working Group session at the S.A.F. National Convention, Richmond, VA, p. 338 (October 25-28, 1992).

[78]PACFISH is the acronym for: *Environmental Assessment for the Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California*, USDA Forest Service and USDI Bureau of Land Management, FR Doc. 94-7042 (March 18, 1994).

[79]Sample, *supra* note 77, at 338.

[80]Cubbage, F.W. and W.C. Siegel. *The Law Regulating Private Forest Practices: Local, state, and federal rules pass most legal tests.* 83(9) JOURNAL OF FORESTRY 538 (September 1985).

[81]Goldstein, B. *The Struggle Over Ecosystem Management at Yellowstone*, 42(3) BIOSCIENCE 183, 187.

[82]Cortner and Moote, *supra* note 2, at 313.

voluntary means, will depend largely on the attitudes of the private landowners.[83] Public, political, and economic interests do not always support holistic, system-wide management.[84]

Caldwell (1970) suggests that private possession of land under ecological ground rules could be made consistent with an ecosystem management scheme.[85] The individual landowner would lose certain rights and gain certain protections.[86] From a legal viewpoint, however, a public land policy for "private" lands could appear to be a contradiction in terms.[87]

Traditionalists are suspicious of the environmental philosophy embedded in ecosystem management.[88] The term "ecological" in any form, including "ecosystem management," conjures up images of environmentalists running amok, taking over all public land management to the detriment of honest working folks. Certainly, ecosystem management will require curtailment of resource extraction in some localities. In resource-dependent localities, the growing fervor for ecosystem management is a very real threat to the communities' livelihood. Keiter (1994) believes that the challenge is to convince these communities that ecosystem management can foster sustainable economic opportunities, and thus ensure community stability.[89] Perhaps, the real challenge is to make certain that any ecosystem-wide management plan incorporates real economic opportunity for affected communities that does not completely destroy their local cultures.

Many western communities are already struggling with the transition from resource extraction-dependent economies to some other economic base (i.e. tourism, recreation). A long-standing distrust of federal regulation adds to concern over losing jobs if the government further restricts activities on multiple-use lands.[90] Successful implementation of ecosystem management will require developing alternatives acceptable to these communities that will ease their transitions to becoming participants and proponents of ecosystem management, rather than remaining vocal and influential opponents.

Two respondents mentioned that takings law may threaten ecosystem management plans if the private property owners object to regulations thrust upon them. The Property

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[83] *Id.*

[84] Clark and Harvey, *supra* note 67, at 283.

[85] Caldwell, L.K. *The Ecosystem as a Criterion for Public Land Policy.* 10 NAT RESOURCES J. 203, 209 (1970).

[86] *Id.*

[87] *Id.* at 219.

[88] Cortner and Moote, *supra* note 2, at 312.

[89] Keiter, *supra* note 13, at 323.

[90] Goldstein, *supra* note 81, at 185.

Clause of the United States Constitution grants the federal government the power to regulate activities on private lands to protect public land resources.[91] However, public taking of private property without just compensation is proscribed by the Fifth Amendment to the United States Constitution and its state counterparts.[92] The Fifth Amendment's takings clause is applied to the states through the due process clause of the Fourteenth Amendment which specifies that no state shall "deprive any person of life, liberty, or property without due process of law." The Supreme Court has held that if the land-use regulation proves overly burdensome, the private property owner can maintain a takings claim against the government by showing that either: (1) the regulation is not substantially related to legitimate government interests, or (2) the regulation deprives the owner of economically viable uses of the property.[93] Despite literally thousands of judicial decisions, the line between noncompensable, police-power regulation and compensable takings remains uncertain.[94] Takings doctrine may or may not prevent ecosystem management plans from extending to private lands. This problem might be especially noteworthy in areas with checkerboard public and private ownership. If consensus among public and private landowners regarding management plans cannot be achieved then a full-scale takings analysis may be necessary.[95]

5. Institutional Culture

a. Technical bias

The institutional culture in the Forest Service with its technical experts, narrow biological focus, and functional approach was cited as a barrier by 30% of the respondents.

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[91] *See, i.e.*, Minnesota v. Block, 660 F.2d 1240, 1249 (8th Cir. 1981), *cert. denied*, 455 U.S. 1007 (1982); *United States v. Lindsey*, 595 F.2d 5 (9th Cir. 1979); United States v. Brown, 552 F.2d 817 (8th Cir. 1977), *cert. denied*, 431 U.S. 949 (1977).

[92] Cubbage and Siegel, *supra* note 80, at 539.

[93] *See, i.e.*, Lucas v. South Carolina Coastal Council, 112 S. Ct. 2886 (1992); Nollan v. California Coastal Comm'n, 483 U.S. 825 (1987); First English Evangelical Lutheran Church v. Los Angeles County, 482 U.S. 304 (1987).

[94] Cubbage and Siegel, *supra* note 88, at 539.

[95] For further reading regarding takings see: Mansfield, M.E. *When "Private" Rights Meet "Public Rights": The Problems of Labeling and Regulatory Takings*, 65 COLO. L. REV. 193 (1994); Paster, J.D. *Money Damages For Regulatory 'Takings'*, 23 NATURAL RES. J. 711 (July 1983); Sax, J.L. *Property Rights and the Economy of Nature: Understanding Lucas v. South Carolina Coastal Council*, 45 STAN. L. REV. 1433 (1993)..

The general theme among the comments was that agency employees tend to be specialists, which contributes to their emphasis on viewing problems in a functional way. One respondent noted that "technical specialists tend to have narrow points of view. The more education they have, the narrower their point of view becomes." Magill (1988) noted that foresters exhibit a homogeneity of attitudes and actions possibly traceable to their technical training and organizational indoctrination.[96] Grumbine (1994), upon completion of an extensive literature review, concluded that most ecosystem management authors are biologists who emphasize scientific aspects, while underestimating the policy implications of organizational change and the complexities of blending diverse human values into management prescriptions.[97] This homogeneity may render the organization "highly resistant to any change in goals."[98] Super et. al. (1993) noted that "hard scientists" have traditionally viewed the social, cultural, spiritual, economic, ethics, and other components of the human dimension with some skepticism.[99] Decker (1992) believes that this philosophical barrier is a much greater hindrance than deficiencies in particular skills.[100] Natural resource professionals "tend to lack a social orientation; rather, they are oriented to the protection and management of 'things' - trees, water, forage, and wildlife".[101] A similar tradition exists among wildlife managers who regard biological considerations as the primary determinants of management decisions.[102]

The technical jargon used by resource managers and complexity of planning documents tend to discourage public involvement.[103] Social scientists and technical professionals often use different sets of terminology resulting inevitably in miscommunication. Analysts in the wildlife arena concluded that:

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[96]Magill, A.W. *Barriers to Effective Public Interaction.* JOURNAL OF FORESTRY 16 (October 1991).

[97]Grumbine, *supra* note 7, at 31.

[98]*Id., citing* Twight, B.W. and F.J. Lyden. *Multiple Use Vs. Organizational Commitment.* 34(2) FOREST SCIENCE 474-86.

[99]Super, G. et. al. (The Human Dimension Task Group). *The Human Dimensions of National Forest Ecosystem Management: An Issue Paper.* In: Lund, H.G., ed. Proceedings National Workshop Integrated Ecological and Resource Inventories, USDA Forest Service, Phoenix, AZ, p. 23 (April 12-16, 1993).

[100]Decker, D.S., T.L. Brown and G.F. Mattfield. *Integrating Social Science into Wildlife Management: Barriers and Limitations.* In: Miller, M.L. et al., eds., Social Science in Natural Resource Management Systems, p. 86 (1987).

[101]Magill, *supra* note 96, at 16.

[102]Decker et. al., *supra* note 100, at 85.

[103]Magill, *supra* note 96, at 16.

> Although wildlife managers and administrators use a biological jargon of their own, they often criticize social scientists for similar behavior. Somehow, terms like biological carrying capacity, ecotone, edge effect, limiting factors, and MSY are acceptable. But, role model, social referent, innovation, adoption, belief-attitude-behavioral intention systems, and motivation are considered jargon.[104]

The poor image of social scientists among some resource managers must be rectified to ease public participation elements of ecosystem management.

b. Social interactions

Another theme, mentioned by six Forest Service respondents, is that agency employees need more training in social interaction techniques. A Forest Supervisor felt that the Forest Service lacked the appropriate social expertise in this era of downsizing and that hiring employees with the appropriate skills is necessary. A March 1993 Forest Service Washington office independent review of how well the human dimension perspective is being integrated into ecosystem management efforts at the Forest Service Regional Office level discovered few effective efforts to fully incorporate the human dimension with the substantial biological and physical efforts already underway.[105] Foresters are accustomed to speaking in terms of board feet and find it much more difficult to describe the meaning of wilderness or the value of biodiversity.[106] In a study of six western forests, Shannon (1987) found that "a participatory management style by forest supervisors or district managers was usually related to an education in the social sciences; personality style; or experience with complex social environments; objectives-oriented management, or multidisciplinary planning."[107]

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[104]Decker et. al., *infra* note 132, at 87.

[105]Super, G. et al. (The Human Dimension Task Group). *The Human Dimensions of National Forest Ecosystem Management: An Issue Paper.* In: Lund, H.G., ed. Proceedings of the National Workshop on Integrated Ecological and Resource Inventories, USDA Forest Service, Phoenix, AZ, p. 23 (April 12-16, 1993).

[106]Vining, J. *Environmental Values, Emotions, and Public Involvement.* Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 26, 31 (November 19-21, 1991).

[107]Shannon, M.A. *Forest Planning: Learning with People.* In: Social Science in Natural Resource Management Sysytems, Miller, M.L. et. al., eds., Boulder, CO, Westview Press, p. 233-52 (1987); Cortner, H.J. and Shannon, M.A. *Embedding*

Natural resource professionals are predisposed toward independent decisionmaking and autonomous action, and favor a straight-line scientific approach rather than one involving abstract concepts and alternative solutions.[108] Ecosystem management will require a shift in professional methods from a focus on scientific measurement to consideration of socio-political techniques of communication and consensus management.[109] "The human elements of ecosystem management must include information about people's traditional and changing perceptions, beliefs, attitudes, behaviors, needs, and values and the past, present, and possible future influences of humans on ecosystems."[110] The emphasis on scientific management and "timber primacy" ignores elements of ecosystem management. Shepard (1994) concludes that forest management as applied biological or physical science is a politically inadequate response to today's challenges.[111] Social interaction techniques will continue to play a pivotal role in future of ecosystem management as pressures on limited resources increase.

c. Timber production orientation

Another Forest Service theme, mentioned by five respondents, is that many foresters in the agency still have a professional bias toward logging activities as the preferred management alternative. A perception of this bias is echoed in the literature: "a combination of directives and incentives has been in place so long that many forest managers have all their training and experience in the management of timber sales."[112] In the past, logging has been viewed by Forest Service officials as the best way to achieve a wide array of management objectives, from fire and insect control to wildlife management.[113] In the past, the Forest Service has emphasized timber harvesting in regions where timber is of marginal quality and the costs of production far outweigh the

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Public Participation in its Political Context. 91(7) JOURNAL OF FORESTRY 14 (July 1993).

[108]Magill, *supra* note 96, at 16.

[109]Cortner and Moote, *supra* note 2, at 314.

[110]Super, G., *supra* note 105, at 21.

[111]Shepard, W.B. *Ecosystem Management in the Forest Service: Political Implications, Impediments, and Imperatives.* In: Jensen, M.E. and P.S. Bourgeron, eds. Eastside Forest Ecosystem Health Assessment -- Volume II: Ecosystem Management Principles and Applications, USDA Forest Service, PNW Research Station, Portland, OR, p. 30 (1994).

[112]Goldstein, *supra* note 81, at 302.

[113]*Id.*

returns.[114] These harvests resulted in a Forest Service net operating loss of $1 billion in both 1985 and 1986.[115] The Forest Service's explanation for continuing marginal timber harvests is that they help stabilize local economies, provide additional recreational access and enhance wildlife habitat.[116]

The Forest Service respondents thought that their institutional culture, ingrained by its commodity-production past, would be hard to shake. Four respondents noted that the agency lacks incentives to do ecosystem management-type work. A District Ranger identified one problem: "certain goods such as wildlife viewing, aesthetics, hiking, hunting, and fishing are difficult to quantify." Another District Ranger felt that a new definition of "achievable work" unrelated to targets and timber production is required before employees would take ecosystem management seriously. Two District Rangers and two forest-level Ecosystem Management Coordinators thought that ecosystem management at this early stage is viewed as extra, "skunk" work piled on top of employees' already busy schedules. They all felt that if ecosystem management is really to be taken seriously, then resources (both financial and human) must be devoted exclusively to the task. Some type of structural change appears necessary because as Sax and Keiter observe: although many parties still insist that the Forest Service is "timber driven" and commodity goals prevail over every other goal, irreversible pressures continue to push the Forest Service away from such institutional single-mindedness. These pressures include litigation by citizen groups, growing local constituencies with environmental and recreational demands, and the influence of neighboring national parks.[117]

One Regional Social Science Coordinator said that the science of understanding ecosystems is very complex because it cuts across many different scientific disciplines and is constantly evolving. He thought that, given the traditional scientific emphasis of the Forest Service, it may be difficult for the agency officials to synthesize the massive amount of complex scientific data with public values to connect the scientific "ecosystem" principles with the human-oriented "management" considerations. Agee and Johnson termed this constraint to ecosystem management - disciplinary myopia - science is unwilling to generalize.[118]

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[114]Leal, *supra* note 73, at 28.
[115]*Id.*
[116]*Id.* at 30-31.
[117]Sax and Keiter, *supra* note 9, at 246.
[118]Agee and Johnson, *supra* note 11, at 230.

6. Institutional Attitudes - Fear of Public Involvement

Twenty-six percent of respondents, consisting mainly of Forest Supervisors and forest-level Ecosystem Management Coordinators, considered managers' fear of public involvement among the most important barriers identified. A common theme among the remarks was that managers are used to controlling decisionmaking and are not used to an open public forum. A forest-level Ecosystem Management Coordinator said that "Forest Service managers generally believe that they are the experts regarding natural resource decisions anyway and do not want their scientific expertise diluted by including the less-knowledgeable public." Boyle and Shannon (1994) found that Forest Service employees "have great ambivalence about accepting the public's knowledge about what they consider a scientific-based decision."[119] Evidence shows that resource professionals welcome public input to their programs, but doubt its validity.[120] Research professionals who think they "know best" consider the public "unknowledgeable," and tend to antagonize concerned citizens with different values.[121] A Forest Supervisor said that agencies are not used to reaching out to the public in an open forum and asking how to manage: "they like to come up with a plan and then go from there." In contrast, studies of participants in national forest planning show that citizens prefer planning procedures that involve two-way communication and allow shared decisionmaking.[122]

Natural resource managers have not been adequately trained to address value-laden questions.[123] "Although there is resounding evidence of changing attitudes, there is also continuing evidence that decisions made by natural resource personnel display legal and technical narrowness and lack of imagination when innovative decisions are required."[124] "As long as we pretend that resource conflicts can be resolved by dividing the forest pie into more or different pieces, our creativity cannot be used to reorganize society and its relationships to the forest."[125] As population pressures increase, the forest cannot be forever divided and still continue to support human societies.[126] Due to their scientific

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[119]Boyle and Shannon, *supra* note 20, at 5.
[120]Magill, *supra* note 96, at 16.
[121]*Id.*
[122]Force, J.E. and K.L. Williams. *A Profile of National Forest Planning Participants*. 87(1) JOURNAL OF FORESTRY 33-38 (January 1989).
[123]Magill, *supra* note 96, at 16.
[124]*Id.* at 17.
[125]Shannon, M.A. *Foresters as Strategic Thinkers, Facilitators, and Citizens*. 90(10) JOURNAL OF FORESTRY 24, 24-5 (October 1992).
[126]*Id.* at 25.

training, resource managers tend to be unreceptive to alternative opinions.[127] "As long as professional foresters consider public deliberation of forest policy to be unrelated to their job, they will remain outside the policy communities that are struggling to comprehend forest ecosystems both biophysically and socially."[128]

Another theme among respondents was that many managers fear the increased criticism of a more open public decisionmaking process. One Regional Social Science Coordinator thought that part of this fear resulted from "the past process not being as open as it could have been." A forest-level Ecosystem Management Coordinator observed that the agencies "tend to want to avoid controversy until their management decisions have been worked out internally." He said that this defensive way of thinking has been caused by conservation groups fighting every single Forest Service decision. Boyle and Shannon (1994) discovered that Forest Service employees described the Forest Service "as an organization in which trust and teamwork have been severely eroded by employee beliefs that management decisions will not consider expert advice, that managers do not respect lower level decisions, and that team approaches to decisionmaking are controlled by legal threats and managers' desires to control information."[129] Environmental groups have increasingly used administrative appeals and litigation to successfully challenge resource management policies and practices.[130] A District Ranger thought that managers commonly felt that a more open process just maximized the possibilities of a lawsuit. Also, OGCs advised managers to engage in a conservative NEPA process (i.e. only open the process to public participation where NEPA requires it, even though no law prevents maintaining an open process throughout). Daniels et. al. (1994) argue that "the stakes involved in 'us versus them, winner takes all' confrontations compel groups to fortify positions and encourage competing claims for natural resources that, if met, may not be consistent with ecosystem health."[131] Successful implementation of ecosystem management will require overcoming agency managers' learned fear of public involvement.

127Magill, *supra* note 96, at 17.

128Shannon, *supra* note 125, at 27.

129Boyle and Shannon, *supra* note 20, at 4.

130Grumbine, *supra* note 7, at 29.

131Daniels, S.E., G.B. Walker, J.R. Boeder, and J.E. Means. *Managing Ecosystems and Social Conflict.* In: Jensen, M.E. and Bourgeron, P.S., eds., Volume II: Ecosystem Management: Principles and Applications. Gen. Tech. Rep. PNW-GTR-318, Portland, OR, USDA Forest Service, PNW Research Station, p. 327 (1994).

7. Institutional Structure

Twenty-six percent of respondents, mainly Forest Service employees at the regional and local levels, mentioned that a number of aspects of the Forest Service's structure made implementation of ecosystem management difficult. The common theme was that the agency is structured around functional goals which relate to the budget line items. One respondent remarked that this structure promotes a "stovepipe" perspective among agency officials who become interested only in completing their own programs. A District Ranger said that often promotions are tied to completion of these functional goals. A forest- level Ecosystem Management Coordinator observed that this structure does not reward risk-taking or innovation, thereby discouraging forward-thinking ecosystem managers. Boyle and Shannon (1994) discovered that Forest Service employees find the current reward system "inconsistent with where the Forest Service should be going as an organization."[132] In a study of six western forests, Shannon (1987) found that whether managers became innovators depended heavily on the reward system and on tolerance within their particular agency for diverse policy and management directions based on local differences.[133] Managers need to develop innovation, anticipation, and communication skills.[134]

"Implementing ecosystem management requires changes in the structure of land management agencies and the way they operate."[135] A Regional Social Science Coordinator noted that the functional agency structure causes a second problem: interdisciplinary teams are used only for review and not for planning. In addition, the research scientists are separated organizationally from the public resource managers, making coordination of science and management practice difficult. Finally, the splintered nature of the land management scheme between agencies (i.e. USFS, BLM, State) is frustrating to private industry which must constantly respond to several agencies at once. Grumbine (1994) argues that required structural changes range from the simple (forming an interagency committee) to the complex (changing professional norms, altering power relationships).[136]

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[132]Boyle and Shannon, *supra* note 20, at 7.

[133]Shannon, M.A. *Forest Planning: Learning with People*. In: Social Science in Natural Resource Management Sysytems, Miller, M.L. et. al., eds., Boulder, CO, Westview Press, p. 233-52 (1987); Cortner, H.J. and Shannon, M.A. *Embedding Public Participation in its Political Context*. 91(7) JOURNAL OF FORESTRY 14 (July 1993).

[134]Cortner and Shannon, *supra* note 133, at 15.

[135]Grumbine, *supra* note 7, at 31.

[136]*Id.*

Two District Rangers felt that their most effective public meetings were smaller in size than the "include everyone" requirements of FACA. Cortner and Shannon (1993) found that whenever informal discussions actually influenced planning or policy, citizens worked directly and closely with local staff.[137] But, when access was limited merely to formal channels, and staff merely acknowledged citizen comments, the citizens were more likely to use other forums, such as the courtroom, to affect agency decisions and policies.[138]

Another common theme among District Rangers was that local authorities have little authority to make independent decisions and not enough staff to cover all the weekend and evening meetings necessary for successful public involvement. Two District Rangers and a forest-level Ecosystem Management Coordinator echoed similar opinions that the Forest Service has no clearly separate ecosystem management teams and the dual role of performing management activities (i.e. timber harvesting, resource extraction) and coordinating appropriate management activities for ecosystem management may prove too difficult. Already, some managers complain about the lengthy process required to perform any action. One District Ranger summed it up: "Ecosystem management will require shortening the paperwork somehow if anything is going to get accomplished."

8. The Challenge Of Responding To The Concerns Of Multiple Publics

Twenty-six percent of respondents believed that various "public interest" concerns raised barriers to ecosystem management. Nine respondents, representing the gamut of groups polled, commented on agency difficulty in responding to the needs of disparate groups. Cortner and Moote agree that the vast differences of opinion regarding management practices breed conflict and inefficiency.[139] Finding common ground between consumptive-use activities and the tourism-recreation industry has proven exceedingly difficult.[140] Confronted regularly with conflicting public opinions regarding the importance of environmental protection versus resource development, the agencies have been unable to convey to the public how to weigh often competing national and local

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137Cortner and Shannon, *supra* note 133, at 15.

138*Id.*

139Cortner and Moote, *supra* note 2, at 313.

140Gillis, A.M. *The New Forestry: An Ecosystem Approach to Land Management.* 40(8) Bioscience 558 (1990); Keiter, *supra* note 11, at 941.

interests in establishing priorities.[141] Caught among the environmental, tourism, and resource lobbies, managers have recently avoided making controversial decisions.[142] An important challenge to ecosystem management is finding common ground between agencies, their employees, and the public to establish unambiguous common goals.[143] Interest groups with conflicting values in competition for limited environmental resources have been pitted in an adversarial process that does not reward compromise.[144] Federal land managers have found their options increasingly narrowed by political pressure at one end of the spectrum and the threat of litigation from environmental groups at the other end.[145] Perhaps one necessity of effective ecosystem management is to develop a toleration for ambiguity and disagreement among these groups to avoid deadlocks.

A common theme reflected by the Forest Service and BLM respondents was how difficult they found it to properly manage the land and simultaneously please all constituents. They were worried more about managing their land effectively, without lawsuits and appeals, than pleasing constituents so that they were all "happy." According to various analysts, the Forest Service has created some of its own difficulties. Agencies have unwittingly promoted divisiveness and polarization in their contacts with the public by exerting authority instead of sharing power.[146] One cause of this problem is that the Forest Service resisted change and stuck to its old paradigm for too long thereby losing its credibility in the public arena.[147] During the past two decades, communication between resource managers and their constituents has become increasingly adversarial.[148] Environmentalists are suspicious that foresters, and the Forest Service in particular, are not

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[141]Keiter, *supra* note 13, at 321; *see also* Sirmon, J. et al., *Communities of Interests and Open Decisionmaking*, 91 JOURNAL OF FORESTRY 17 (July 1993).

[142]Goldstein, *supra* note 91, at 185.

[143]Agee and Johnson, *supra* note 11, at 230.

[144]Loeks, C.D. *Thinking Laterally: Strategies for Strengthening Institutional Capacity for Integrated Management of Riparian Resources.* A paper presented at the First North American Riparian Conference - Riparian Ecosystems and their Management, Tucson, AZ (April 16-18, 1985).

[145]Goldstein, B.E. *Can Ecosystem Management Turn an Administrative Patchwork into a Greater Yellowstone Ecosystem?*, 8 NORTHWEST ENV. J. 285 (1992); Keiter, *supra* note 10, at 38.

[146]Sirmon, J., W.E. Shands, and C. Ligett. *Communities of Interests and Open Decisionmaking.* 91(7) JOURNAL OF FORESTRY 17 (July 1993).

[147]Daniels, O. (Retired Forest Supervisor). Comments at Montana Society of American Foresters 81st Annual State Meeting (March 3-4, 1994).

[148]Vining, J. and H.W. Schroeder. *Emotions in Environmental Decision Making: Rational Planning Versus the Passionate Public.* In: Miller, M.L. et. al., eds., Social Science in Natural Resource Management Systems, p. 181, 182 (1987).

matching their actions on the ground with their policy pronouncements.[149] Given the inherent scientific complexity and unpredictability of ecosystem management, the agency's lack of priority-setting will make the already difficult public participation process even harder.

For the most part, old participation techniques consisted of bureaucratic exercises "to exchange information, to request comments on issues or proposals that had already been formed, or to hold public meetings or consultations about restricted alternatives."[150] Participation techniques were narrowly designed to ensure agency compliance with statutory and regulatory requirements.[151] Additionally, interest groups ask people to choose sides causing conflict and a lack of trust that leads to polarization among the parties with fewer and fewer people remaining in the middle where a consensus might be possible.[152] Traditional public involvement processes created foes when they should have built relationships.[153] "Forums for true public deliberation expand understanding, incorporate diverse perspectives, shape interests as consequences are clarified, build trust, expose the processes of value formation, articulate visions of the future, and define public problems."[154] "Thus, the move toward ecosystem management from a natural resources management approach is also a move from the politics of competition and division, to the politics of cooperation and difference."[155]

All of the NGOs contacted for this paper confirm that the public generally does not trust the agencies to manage the public lands. One NGO noted that the public has declining faith in public institutions. Environmental groups have increased clout and a well-developed suspicion of agency actions. The public has also been generally opposed to private acquisition of public lands (i.e. via exchange). Forest Service respondents noted a need for an internal and external education process to combat the growing lack of trust. Many agency respondents cited the need for patience and time to overcome these problems because, as one respondent put it, trust is "earned not blindly given." Government advocates of ecosystem management cannot simply expect public trust, they must earn

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149Cortner and Moote, *supra* note 2, at 312.

150Cortner and Shannon, *supra* note 133, at 15.

151*Id.*

152Artley, D. (Montana State Forester and Administrator of the Forestry Division). Comments at Montana Society of American Foresters 81st Annual State Meeting (March 3-4, 1994).

153Sirmon et al., *supra* note 146, at 17.

154Shannon, M.A. *Ecosocial Systems in an Evolving Policy Context.* Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 88, 94 (November 19-21, 1994).

155*Id.* at 95.

it.[156] Managers must recognize that before they can change people's behavior, they must first change their attitudes.[157] One analyst characterizes the public as "unsatisfied and unconvinced with past and current forest practices -- as they perceive them through the fog of media incompleteness, special interest group distortion, agency bureaucracies, and academic jingoism."[158]

Public opposition to controversial resource planning decisions has caused a tremendous increase in litigation.[159] In anticipation of legal challenges, managers tried to make sure that they could defend their planning decisions with the logical criteria of the legal system, which require that management goals, policies and regulations be explicit, traceable, and public.[160] This legal and scientific decisionmaking context strongly encourages managers to eliminate subjective content such as emotion when presenting their decisions to other professionals and the public.[161] "This process may increase the gap of understanding between professional decision makers who must rationally justify their decisions and members of the general public who may be as emotional in their decisions as they wish."[162] Successful ecosystem management may require a renewed focus on public emotions as a component of the planning process.

The challenge for ecosystem management "is to recognize resource planning as a forum for public deliberation on the shape of a common future."[163] Any ecosystem management scheme must incorporate two lessons: (1) planning is a political exercise that involves the public, and (2) public participation both affects and in turn is affected by organizational and public learning."[164]

9. Agency Budgets

Twenty-four percent of respondents expressed particular concern regarding the format and incentives created by the Congressional Appropriations process that determines

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156Artley, *supra* note 152.
157*Id.*
158Machlis, *supra* note 22, at 29.
159Dana, S.T. and S.K. Fairfax. *Forest and Range Policy: Its Development in the United States*, New York, NY, MacGraw-Hill (1980).
160Vining and Schroeder, *supra* note 148, at 182.
161*Id.*
162*Id.* at 182-3.
163Cortner and Shannon, *supra* note 133, at 16.
164*Id.*

Forest Service expenditures. The common theme among the comments was that the line-item funding structure encourages continued functional management with its emphasis on completing specific targets rather than encouraging a broad management scheme. Keiter (1989) argues that budgetary incentives have created an agency culture closely tied to tradition and uncertain about the advantages of new ideas such as ecosystem management.[165] Two District Rangers believed that Congress' insistence on line-item accountability fractures the agency, and prevents it from working as one cohesive unit.

Another common theme among respondents was that the traditional appropriations process creates perverse incentives by rewarding timber-related activities and production of board-feet only. A forest-level Ecosystem Management Coordinator and a District Ranger believed that the Congressional budget process sends a mixed message to the lower-level Forest Service employees regarding timber production when compared to the overall public sentiment against overcutting. Traditionally, agency budgets have been tied to resource production by the Congressional appropriations process.[166] "Resource-oriented appropriations encourage the administration and Congress to specify output targets, especially for timber, because such targets are easily specified and are controllable by Forest Service managers."[167] Congressional stimulants to logging include high road building appropriations and rebates to companies that build new roads to reach harvesting sites on national forest land.[168]

"Most operations are funded directly or indirectly where they can be justified for either timber management or fire control."[169] In addition, special accounts and trust funds, which result largely from timber activities, encourage continued emphasis on timber outputs by providing counties and the agency with benefits from increased timber sales.[170] Because federal agencies are dependent on Congressional approval for funding, it is unlikely that changing management to a focus on ecological states rather than production

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165Keiter, *supra* note 13, at 318.

166Wilkinson, C.F. *Crossing the Next Meridian: Land, Water, and the Future of the West* (1992).

167U.S. Congress, Office of Technology Assessment. *Forest Service Planning: Accommodating Uses, Producing Outputs, and Sustaining Ecosystems*, OTA-F-505 (Washington, D.C.: U.S. Government Printing Office, February 1992), p. 14.

168Goldstein, *supra* note 81, at 185.

169Oliver, C.D., W.H. Knapp, and R. Everett. *A System for Implementing Ecosystem Management*, In: Jensen, M.E. and P.S. Bourgeron, eds. Eastside Forest Ecosystem Health Assessment -- Volume II: Ecosystem Management Principles and Applications, USDA Forest Service, PNW Research Station, Portland, OR, p. 355, 357 (1994).

170US CONGRESS, *supra* note 167, at 12.

will happen without a change in the appropriations process.[171] Sample (1990) notes the difficulty and imprecision of translating line items into integrated resource projects and then trying to accurately allocate time among the resource line items.[172] Thus, Forest Service officials have been foreclosed from giving ecological considerations priority over congressionally mandated timber production targets.[173]

Although not mentioned by interview respondents, analysts frequently cite the Knutson-Vanderberg Act of 1930 as another source of negative Forest Service incentives. The Act was intended to ensure that the Forest Service would reforest timber land to maintain a sustained yield. The Forest Service retains a portion of the timber receipts for reforestation and discretionary usage, which creates an incentive to sell timber in marginal areas.[174] The result is that the Forest Service builds roads into environmentally sensitive areas to harvest low grade timber whose sale results in a loss to the public treasury.[175]

10. Building Public Interest In Ecosystem Management

Nineteen percent of respondents remarked on the need to build public interest in ecosystem management. A shared concern among them was the need to get the public involved and aware that public involvement is necessary for the success of ecosystem management. Two Regional Ecosystem Coordinators thought gaining public understanding was quite difficult. One Regional Ecosystem Coordinator perceived that conservation groups understand the importance of ecosystem management, but the general public does not. A Regional Social Science Coordinator summarized the problem as follows: "the public is apathetic, does not seem to care, and just wants its recreation." Caldwell (1970) agrees that most average citizens who live in urban areas are likely to be

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171 Cortner and Moote, *supra* note 2, at 313.

172 Sample, V.A. *The Impact of the Federal Budget Process on National Forest Planning*. New York, NY: Greenwood Press (1990). For more information on budgets, *see*, Sample, V.A. *The Forest Service Budget Process: Changes Are Needed To Facilitate Implementation of the National Forest Management Act*, OTA background paper (Oct. 15, 1990); Sample, V.A. *Improving the Linkage Between the RPA Assessment Findings and the RPA Program: The View From the Office of Management and Budget*, Binkley, C.S., G.D. Brewer, and V.A. Sample, eds, Redirecting the RPA, Proceedings of the 1987 Airlie House Conference on the Resources Planning Act, 95 Yale School of Forestry and Environmental Studies Bulletin 161-175 (1988).

173 Keiter, *supra* note 13, at 318.

174 Goldstein, *supra* note 145, at 301.

175 *Id.*

totally unfamiliar with ecosystem concepts and unable to evaluate the concepts' significance to their lives.[176] While society has dramatically shifted its perception of forest management, its demands for resources have persisted.[177] Before ecosystem management can succeed, there is a need for widespread understanding of why new policies are required, what outcomes are anticipated, and an ethical reorientation.[178]

As discussed earlier, a problem in garnering public support for ecosystem management is the need to get "different publics" involved so that they can decide whether a management scheme is in their best interest. One forest-level Ecosystem Management Coordinator summarized the problem as: "the need for public understanding, acceptance, and endorsement" of the ecosystem management concept. One of the biggest challenges to ecosystem management is to ensure that public desires are compatible with ecosystem potentials.[179] A Regional Social Science Coordinator felt that natural resource managers and scientists must present educational opportunities for both the public and political leaders about the various choices, costs, and consequences of public land management decisions.

11. Scattered Ownership of Public Lands

Fifteen percent of respondents, including NGOs, private industry executives, BLM planners, and officials at all levels of the Forest Service, consider the scattered, checkerboard ownership pattern of lands between federal agencies, states, and private owners a major political barrier to implementing ecosystem management. The respondents' comments reflected a common theme: ecosystem management plans must cross jurisdictional boundaries which will be a logistical nightmare. Four respondents noted that neighbors in the checkerboard areas often have disparate land management goals making management planning on large tracts difficult.

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[176]Caldwell, *supra* note 85, at 218.

[177]Hegreberg, C. (Executive Vice-President of Montana Wood Products Assoc.). Comments at Montana Society of American Foresters 81st Annual State Meeting (March 3-4, 1994).

[178]*See* Goldstein, *supra* note 81, at 186.

[179]Jensen, M.E. and R. Everett. *An Overview of Ecosystem Management Principles*. In: Jensen, M.E. and P.S. Bourgeron, eds. Eastside Forest Ecosystem Health Assessment -- Volume II: Ecosystem Management Principles and Applications, USDA Forest Service, PNW Research Station, Portland, OR, p. 7, 10 (1994).

The political boundaries on public lands simply do not reflect ecological conditions.[180] Few areas of the United States exist where delineation of ecosystem boundaries does not encompass a mixture of public and private lands, often in an intermingled pattern inconsistent with ecological boundaries.[181] Many key statutes were created to address human concerns with no conception of ecosystems or natural processes.[182] "Management units often bear no relation to the realities of ecological systems (even the home-range of the species for which protection is sought), their connections to economic and social processes, or local peoples' cultural and political identity."[183] Arbitrary management units lead to great difficulties in achieving sustainable development planning because they fail to foster a sense of community among the people in the unit and make consistent management of a complete ecological unit impossible.[184] Some analysts believe the most significant obstacle to ecosystem-wide conservation of nature is the disparity between official boundaries and biological ones.[185]

Property law in the United States effectively carved up natural resource systems into arbitrary tracts, often with straight edges, to grant owners the right to enclose their land.[186] Natural resource system function was generally considered secondary to human development. Public land management traditionally has been dominated by a commitment to exploitation and extraction of natural resources.[187] A difficulty in implementing ecosystem management is that, through generations of carving up the land, the legal system that evolved "created ownership patterns, expectations, and claims of rights that build on the destruction and severance of functioning natural systems."[188] The legal system may need to undergo a fundamental shift toward protecting resources with a recognition that all land is not the same.

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[180]Keiter, R.B. *Taking Account of the Ecosystem on the Public Domain: Law and Ecology in the Greater Yellowstone Region.* 60 U. COLO. L. REV. 923, 925 (1989).

[181]Sample, *supra* note 77, at 334.

[182]*See* Goldstein, *supra* note 81, at 185; Goldstein, *supra* note 145, at 305.

[183]Slocombe, *supra* note 5, at 616.

[184]*Id.* at 617.

[185]*See, i.e.*, McNamee, T.M. *Putting Nature First: A Proposal for Whole Ecosystem Management.* 5 ORION NATURE QUARTERLY 4-15; Clark, T.W. and D. Zaunbrecher. *The Greater Yellowstone Ecosystem: The Ecosystem Concept in Natural Resource Policy and Management.* RENEWABLE RESOURCES J. 8 (Summer 1987).

[186]*See* Sax, J.L. *Ecosystems and Property Rights in Greater Yellowstone: The Legal System in Transition.* In: Keiter, R.B. and Boyce, M.S., eds. The Greater Yellowstone Ecosystem: Redefining America's Wilderness Heritage. New Haven, CT, Yale University Press, p. 77-84 (1991).

[187]Keiter, *supra* note 180, at 924-5.

[188]Sax, *supra* note 186, at 79.

The law also has trouble addressing resource protection issues that cut across institutional boundaries because the resources are split among many parties.[189] In an ecosystem context, it would be very difficult to identify and bring all the relevant parties to court regarding air and water quality, or wildlife habitat for every species in the system. Coordination problems are caused not only by split land management responsibilities within the ecosystem, but also by splits in authority regarding enforcement of environmental quality laws.[190] The law has some basic problems identifying and acting on the interests of future generations.[191] Natural resources are always changing and the law has difficulty keeping up. Under the "standing" doctrine, a legal case cannot even be heard by a judge unless the complaining party has suffered a real, personal injury. The legal system focuses on existing problems not those in the future.

Determining the relationship between federal public lands, state lands, and privately owned lands to implement ecosystem management is one of the more difficult political issues facing natural resource managers.[192] Laws are generally reactive and not flexible enough to accommodate the moving target of ecosystem management. Therefore, successful regional management may rest partly on the ability of repeat players to cooperate with each other and to avoid stepping on each other's toes.[193]

12. The Endangered Species Act of 1973

Although only 13% of respondents considered the Endangered Species Act (ESA) a barrier, all of the private industry respondents considered the ESA the most significant barrier. Private industry executives were particularly troubled that ESA analysis does not include economic or human considerations. All respondents who identified the ESA as a barrier thought that the Act's single species focus and concentration on only threatened and endangered species did not fit well with the ecosystem management goal of preserving all species more equally. Private industry respondents were concerned that the

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189Rosenbaum, K.L. *Sustainable Forestry, Sustainable Law.* A paper presented at the Economics, Policy and Law Working Group session of the S.A.F. National Convention, Richmond, VA, p. 307 (October 27, 1992).

190*Id.* at 304.

191*Id.*

192Gaetke, E.R. *The Boundary Water Canoe Area Wilderness Act of 1978: Regulating Non-Federal Property Under the Property Clause,* 60 OR. L. REV. 157 (1981); Sax, J.L. *Helpless Giants: The National Parks and the Regulation of Private Lands,* 75 MICH. L. REV. 239 (1976).

193*See* Sax and Keiter, *supra* note 9, at 225.

ESA concept of "viable populations" was unreasonable in many contexts. For example, one respondent questioned the merit of preserving grizzly bears in all of their former ranges in light of the tremendous human hardship and economic expense resulting from preservation efforts. He wondered why preservation of the grizzly bear was necessary all over the Northern Rockies when viable populations exist in Canada and Alaska. Similar views were expressed at the heavily attended town meeting on reauthorization of the ESA sponsored by U.S. Senator Max Baucus held recently in Montana.[194] Speakers questioned the virtue of reintroducing wolves in the Northern Rockies when 40,000 wolves already live in Canada. Along similar lines, private respondents questioned ESA's definition of "suitable habitat," particularly in regard to anadromous fish habitat and provisions in "PACFISH"[195] calling for wider riparian buffer zones. They thought the definition of "suitable habitat" lacked scientific foundation because it did not include the ocean, where fishing and pollution directly impact fish populations. They felt it was unfair to single out forested areas for regulation when the combined effects of ocean fishing, dams and agricultural runoff prevent significant fish populations from ever reaching forested upland areas anyway.

As identified by private industry concerns, and as evidenced by the current controversies regarding the spotted owl in the Pacific Northwest and the red-cockaded woodpecker in the Southeast, the ESA may significantly impact forest planning, on an ecosystem basis or otherwise. Therefore, the rest of this section briefly identifies some of the ESA provisions that may increase the difficulty of implementing ecosystem management.

a. The purposes and listing requirements of ESA

The Endangered Species Act[196] explicitly recognizes that "species of fish, wildlife, and plants have been so depleted in numbers that they are in danger of or threatened with extinction,"[197] and that they are "of esthetic, ecological, educational, historical, recreational, and scientific value. . . ."[198] The dual purposes of ESA are to provide a means to conserve "the ecosystems upon which endangered species and threatened species

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194*See* The Missoulian, July 24, 1994, section E, at 1.
195PACFISH, *supra* note 78.
19616 U.S.C. §§ 1531-1543 (1988).
19716 U.S.C. § 1531(a)(2) (1988).
198*Id.* § 1531(a)(3).

depend" and to develop a program for conserving those species.[199] Under ESA, "conserving" a species means bringing the endangered or threatened species "to the point at which measures pursuant to [ESA] are no longer necessary."[200] Thus, the intent of ESA "conservation" is recovery of the species.

ESA listings of threatened or endangered species, determined by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service, depend on the following factors:

> (1) destruction, modification, or curtailment of habitat,
> (2) overutilization,
> (3) disease or predation,
> (4) inadequate existing regulations,
> (5) other natural or manmade threats[201]

ESA requires any federal agency contemplating an action that "may affect" a listed species to consult with the USFWS to "insure that the action will not jeopardize the species' continued existence or destroy (or adversely modify) its habitat[202] Thus, ESA explicitly recognizes the link between conserving species and preserving their critical habitat.

b. Possible ESA barriers to ecosystem management

Critics of ESA's usefulness for ecosystem management argue from both economic and ecological perspectives. Economic critics denounce the ESA listing provision which forbids consideration of economic factors: the determination is based "*solely* on the best scientific and commercial data available."[203] Congress specifically directed agencies not to consider economic effects in determining if species are threatened or endangered. The 1982 Merchant Marine and Fisheries House Committee Report on ESA amendments states:

> The addition of the word "solely" is intended to remove from the process of the listing or delisting of species any factor not related to the biological

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[199] *Id.* § 1531(b).
[200] *Id.* § 1532(3).
[201] *Id.* § 1533(a)(1)(A-E).
[202] *Id.* § 1536(a)(2).
[203] *Id.* § 1533(b)(1)(A)(emphasis added).

> status of the species. The Committee strongly believes that economic considerations have no relevance to determinations regarding the status of species and intends that economic analysis requirements . . . not apply.[204]

Courts have strictly interpreted the provisions of the Act to give species protection absolute authority over other managerial mandates on public lands where listed species are present.[205]

From an ecological perspective, managing for one species may be detrimental to other species. This emphasis on single species protection regardless of other resource criteria may limit agency managerial discretion to implement ecosystem management on the public lands where listed species are present. ESA requires the designation of critical habitat in developing and implementing recovery plans.[206] "Critical habitat" for a threatened or endangered species is defined as:

> (i) the specific areas within the geographical area occupied by the species at the time it is listed . . ., on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed . . ., upon a determination by the Secretary that such areas are essential for the conservation of the species.[207]

Generally, proponents of ecosystem management contemplate returning or continuing natural ecological processes in an area. However, critical habitat designations may clash with these ecosystem management efforts. For example, one respondent noted that, in the Hood river area, spotted owl habitat consisted of thick stands of diseased fir trees. Based on historical data, land managers know that the area formerly consisted of open pine savanna. The land managers believe that a prescribed burn would best serve the ecological

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[204]U.S. Congress, *supra* note 167, at 71; *quoting*, U.S. Congress, House Committee on Merchant Marine and Fisheries, *Endangered Species Act Amendments*, Committee Report 97-567, part 1 (Washington DC: U.S. Government Printing Office, May 17, 1982).

[205]*Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978); *Sierra Club v. Yeutter*, 926 F.2d 429 (5th Cir. 1991); *Sierra Club v. Clark*, 755 F.2d 608 (8th Cir. 1985); *Thomas v. Peterson*, 753 F.2d 754 (9th Cir. 1985).

[206]16 U.S.C. § 1533(a)(3)(A) (1988).

[207]*Id.* § 1532(5)(A).

health of the area, but such an action is barred by the spotted owl critical habitat designation. The health of one species - the spotted owl - requires the demise of others - forest species composition and health. Any ecosystem management plan must provide some mechanism for addressing these species-management conflicts in developing large-scale management plans. Otherwise, declining ecological health and increased litigation may result.

All respondents who identified the ESA as a barrier thought the Act's major ecological shortcoming as a basis for ecosystem management is its single species orientation. Recovery plans must "give priority" to endangered or threatened species.[208] Only listed species, which are already on the edge of extinction, qualify for this priority protection. Ecosystem management's holistic approach attempts to preserve all species, not just endangered ones, long before they reach the brink of extinction. All species do not rely on similar habitats. Therefore, ESA recovery plans may prevent actions that benefit some species to protect others. Once again, ecosystem management plans need a mechanism to address these conflicts. Ecosystem management will require addressing questions of scale both in terms of spatial aggregation, and time and assemblages of species being addressed simultaneously.[209]

One analyst argues that other ecological shortcomings of ESA include the following:

(1) it favors mammals over plants, even though conservation biologists draw no distinction between the two,
(2) critical habitat designation requirements do not apply to species listed before 1978, and agency officials can now factor economic and prudential considerations into the designation process, often at the expense of ecological concerns,
(3) the FWS has been very slow in listing threatened species and therefore several species have been lost to extinction,
(4) several important protective provisions do not apply on private lands, which often play quite important roles in ensuring ecosystem integrity.[210]

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[208] *Id.* § 1533(f)(1)(A).
[209] Quigley, T.M. and S.E. McDonald. *Ecosystem Management in the Forest Service: Linkage to Endangered Species Management.* 10(3&4) ENDANGERED SPECIES UPDATE 33 (Jan/Feb 1993).
[210] Keiter, *supra* note 13, at 309.

Any ecosystem management plan must also consider the effects of Section 7 of ESA which specifies that:

> Each Federal agency shall, in consultation with and with the assistance of the Secretary [of Interior and Commerce], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat. . . .[211]

This provision, while encouraging interagency cooperation, may also halt planning activities until potential "jeopardies" to species are figured out. Following interagency consultation, the Secretary is required to issue an opinion on whether the planned actions will jeopardize species or adversely modify critical habitat.[212] Due to their broad spatial scope, ecosystem management plans likely will include some listed species' critical habitat. These plans may be derailed by subsequent jeopardy or adverse modification rulings. If a broad ecosystem plan is halted, it may prove difficult to reassemble all the significant parties for additional collaboration especially with the possibility of another adverse ESA ruling looming in the future.

13. The National Environmental Policy Act (NEPA)

Eleven percent of respondents identified the NEPA process as a barrier to ecosystem management. One pointed out that, as FEMAT indicates, it is impossible for planners to evaluate all the effects of, and alternatives to, an ecosystem level plan. Citizen suits from disgruntled parties based on NEPA violations could easily halt any holistic ecosystem management plan. One District Ranger thought that the NEPA definition of "significant federal action" needs revision because NEPA analysis regarding small, inconsequential projects is severely hampering Forest Service efficiency. Another District Ranger thought that reviews of agency actions should be based on management results rather than the process of analyzing all the alternatives. An additional theme among

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[211] 16 U.S.C. § 1536(a)(2) (1988).
[212] *Id.* § 1536(b)(3)(A).

respondents was that agency employees as a group are uncertain how to document an ecosystem management plan to comply with NEPA.

Two Regional Social Science Coordinators commented that the traditional NEPA process does not require consideration of social factors and past court decisions tend to lessen the importance of social aspects of forest planning. By social aspects, the interviewees were referring to the effects of management plans on communities, economic opportunities, and the like. NEPA, of course, encourages social involvement in the form of public comment, review and critique. One of the Coordinators thought that agencies tend not to include social involvement factors in their analyses because NEPA does not specifically require it. Unless social effects are tied to physical effects, agency interpretations of NEPA send the wrong message to land managers regarding the ecosystem management process. The other Coordinator thought that court decisions have lessened the importance of social/psychological outcomes. He noted that Forest Service compliance with the NEPA process is stuck in a traditional mode of making sure the letter of the law is met, rather than using the substance of the law to seek other innovative methods of achieving meaningful public participation.

A common theme among respondents was that fear of NEPA violations has created a mindframe among employees that they only approach the public after their idea is already well formed. A Regional Social Science Coordinator said "the focus is always on fixing isolated problems rather than prevention of problems at the planning stage." He thought that the formalized structure of the NEPA process results in a highly technical exercise that includes little face-to-face contact and excludes many parties by virtue of its technical nature. Others agreed that public participation is needed earlier in the NEPA process. In response to these concerns, a brief analysis of the NEPA components most relevant to ecosystem management follows.

a. The purposes of NEPA

The purposes of the National Environmental Policy Act of 1969 (NEPA)[213] are threefold:

> (1) To declare a national policy which will encourage productive and enjoyable harmony between man and his environment;

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[213]42 U.S.C. §§ 4321-4370 (1988).

(2) to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; and (3) to enrich the understanding of the ecological systems and natural resources important to the Nation. . . ."[214]

The U.S. Supreme Court has held that NEPA has two objectives: (1) to require agencies to consider the environmental impacts of any proposed action, and (2) to require agencies to show the public that an action's environmental consequences have been evaluated.[215] Basically, NEPA ensures that federal agencies evaluate environmental effects in their decisionmaking processes. Caldwell (1989) calls NEPA "the first comprehensive commitment of any modern state toward the responsible custody of the environment."[216] Although NEPA's ecological focus fits well with the concept of ecosystem management, some of its specific procedural requirements may cause difficulty in implementing it.

b. NEPA's procedural requirements

NEPA requires the preparation of an environmental impact statement (EIS) for "major Federal actions significantly affecting the quality of the human environment."[217] The EIS must disclose the impacts of the action, examine alternatives, and involve the public and other agencies in its preparation.[218] The Council on Environmental Quality regulations, prompted by Executive Order in 1978, set forth further EIS requirements including EIS timelines, and the development and evaluation of alternatives to the proposed action.[219]

NEPA requires public and interagency review, critique, and involvement before any federal agency undertakes a project or commits funds that will have a significant impact on the environment. The development of environmental planning in the United States is

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[214] *Id.* § 4321.

[215] Baltimore Gas & Electric Co. v. NRDC, Inc., 462 U.S. 93, 97 (1982); Weinberger v. Catholic Action of Hawaii, 454 U.S. 139, 143 (1982).

[216] Caldwell, L.K. *A Constitutional Law for the Environment: 20 Years With NEPA Indicates the Need*, 31(10) ENVIRONMENT 6 (1989).

[217] 42 U.S.C. § 4332(2)(C) (1988).

[218] Kirby, P. *Natural Diversity Requirements in Environmental Legislation Affecting Natioanl Forest Planning (Except the National Forest Management Act)*. In: Cooley, J.L. and J.H. Cooley, eds., Natural Diversity in Forest Ecosystems, Proc. of the Workshop, Athens, GA, p. 11, 12 (1984).

[219] 40 C.F.R. §§ 1500-1508 (1986).

closely linked to NEPA's environmental impact statement requirements.[220] The U.S. Supreme Court has ruled that NEPA is a procedural law, rather than a substantive one.[221] NEPA's procedural nature has caused many of NEPA's standards to be refined by a complicated body of case law. But, as long as federal land managers comply with NEPA's procedural requirements, the agency can reach any substantive decision it wishes.[222] "NEPA -- as a procedural matter -- compels land managers to view their actions from an ecological perspective, even if it does not require them to adopt the most ecologically sensitive course of action."[223]

Courts have interpreted NEPA as requiring agencies to perform a comprehensive environmental review and carefully consider all the potential ramifications of their proposed action to comply with NEPA procedural requirements. The Supreme Court has ruled, however, that once a court determines that the agency has taken a "hard look" at a decision's environmental consequences, a court's review is at an end.[224] Thus, courts will scrutinize the process by which the decision was reached by reviewing the adequacy of the accompanying EIS, but courts will not substitute the Forest Service's judgment with their own regarding an outcome.[225]

NEPA's major impacts on forest planning have been: (1) to require consideration of environmental impacts, and (2) to require public disclosure of the planning process. Both of these impacts are also important components of ecosystem management. However, NEPA's procedure for considering environmental impacts may hinder, rather than aid, ecosystem management planning. A NEPA EIS must examine alternatives to the preferred course of action. Any ecosystem management plan, due to its broad scope and holistic approach, may have a virtually inexhaustible list of alternatives. Most EISs that do not satisfy NEPA procedural requirements fail because they do not consider all of the alternatives. Thus, NEPA may provide a vehicle for virtually any disgruntled party to derail efforts at implementing ecosystem management. As evidenced in the FEMAT

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[220]Slocombe, *supra* note 17, at 291.

[221]Baltimore Gas & Electric Co. v. NRDC, Inc., 462 U.S. 93, 97 (1982); Weinberger v. Catholic Action of Hawaii, 454 U.S. 139, 143 (1982); Strycker's Bay Neighborhood Council v. Karlan, 444 U.S. 223, 227 (1980) (per curiam); Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 558 (1978).

[222]Keiter, *supra* note 13, at 313.

[223]Keiter, R.B. *NEPA and the Emerging Concept of Ecosystem Management on the Public Lands.* 25 LAND AND WATER L. REV. 43, 45.

[224]Kleppe v. Sierra Club, 427 U.S. 390, 410 n. 21 (1976); *see also* California v. Block, 690 F.2d 753, 761 (9th Cir. 1982); Thomas v. Peterson, 753 F.2d 754 (9th Cir. 1985), National Wildlife Federation v. U.S. Forest Service, 592 F. Supp. 931, 942-44(D. OR. 1984).

[225]Kirby, *supra* note 218, at 13.

process, it is literally impossible to analyze all potential effects of an ecosystem management plan. The massive amount of paperwork would be crippling, the science cannot be complete, and all alternatives cannot possibly be considered (although NEPA requires it). Ecosystem management contemplates constantly evolving management activities as scientists increase their understanding of the interaction between different ecological disciplines. It is virtually impossible for land managers to fully analyze all environmental consequences before implementing an ecosystem management plan or each time changing science dictates shifting management philosophies.

One possible solution to the problem of analyzing all potential alternatives to an ecosystem management plan lies in a recent Forest Service trend toward programmatic EISs. NEPA regulations require that EISs be site-specific.[226] However, forest plans, due to their complicated nature, do not set forth specific site requirements. Therefore, the Forest Service views the large-scale EISs accompanying these forest plans as "programmatic," assessing the program's (the forest plan's) impacts.[227] Subsequent site-specific environmental analyses are "tiered" to the programmatic EIS, without repeating the programmatic analyses.[228] Ecosystem management plans, to comply with NEPA requirements, may also by necessity be accompanied by "programmatic" EISs which leave site-specific details until later. As new information becomes available, the "program" will not change, but the site-specific detailed plans may be amended. But, this set-up does increase the danger of failure of the overall goal of an ecosystem management program. Due to its holistic nature, an ecosystem management plan may be significantly altered by a successful challenge to one or more of its site-specific parts. In other words, the whole may not equal the sum of the remaining parts.

A second potential NEPA problem in relation to ecosystem management planning is NEPA's timing requirements. As discussed, NEPA saddles agencies with significant procedural obligations before taking any management action. NEPA requires agencies to address the economic and environmental ramifications of every action.[229] The formal NEPA notice and comment periods generally require all comments to be submitted within a 45 day period after the plan is revealed.[230] To prevent huge delays, collaboration regarding ecosystem management plans must begin earlier in the planning process (i.e. when the agency is actually formulating the plan). Although public participation sometimes

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226 40 C.F.R. §§ 1500-1508 (1986).
227 U.S. Congress, *supra* note 167, at 62.
228 *Id.*
229 Keiter, *supra* note 10, at 947.
230 40 C.F.R. § 1506.10(c) (1986).

does occur at an early stage, court rulings and the lack of formal requirements has lessened official emphasis on early involvement. Agency officials must involve the public in the planning process earlier than they have been accustomed to in the past. Forty-five days is not much time to consider ecosystem-level effects. NEPA's formal process requirements may need to be relaxed to mesh with ecosystem management's broad-scale planning and public participation goals.

A third problem regarding NEPA's procedural requirements is that they do not prompt ecosystem-scale analyses. The courts have not consistently interpreted NEPA to require environmental analysis at the relevant ecosystem scale.[231] For example, in *Kleppe v. Sierra Club*[232], the Supreme Court held that regional coal development could begin without a region-wide EIS. In *Robertson v. Methow Valley Citizens Council*,[233] the Supreme Court held that the Forest Service had fulfilled its NEPA procedural requirements, and could authorize construction of a ski resort, even though it would eliminate the local mule deer population. The Court held that the Forest Service had no authority to mitigate effects outside of its jurisdiction nor could it compel any other government agency to do so. This decision does not fit well into the new paradigm of ecosystem management. NEPA does not legally require protection of ecosystem resources that cross interjurisdictional boundary lines.

A fourth potential ecosystem-level planning issue relates to NEPA's agency consultation requirements. Although NEPA requires agencies to consult with each other, it does not designate a mechanism to resolve conflicts when the agencies are in disagreement. Section 102 requires interagency consultation early in the EIS review process: "Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved."[234] NEPA regulations promulgated by the Council on Environmental Quality (CEQ) specifically require public participation: all federal agencies shall "[m]ake diligent efforts to involve the public in preparing and implementing their NEPA procedures, . . . [h]old or sponsor public hearings or public meetings whenever appropriate, . . . and [s]olicit appropriate information from the public."[235] These mandates in NEPA promote interagency coordination and public participation as

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231 Keiter, *supra* note 13, at 314.
232 427 U.S. 390 (1976).
233 490 U.S. 332 (1989).
234 42 U.S.C. § 4332(2)(C) (1988).
235 40 C.F.R. § 1506.6(a),(c),(d) (1990).

would be desirable in any ecosystem management plan.[236] However, NEPA does not require the agency preparing the EIS to follow the advice or heed the comments of another agency.[237] Although the agency must respond to comments in its final EIS, it may reject another agency's comments and ignore its opposition to the action being planned.[238] The success of ecosystem management will, in part, be determined by agencies' willingness to heed each other's advice. NEPA itself is unable to ensure meaningful collaboration.

14. Time frames

Eleven percent of respondents, consisting primarily of forest-level Ecosystem Management Coordinators and District Rangers cited time frames as a significant ecosystem management barrier. A common theme was that ecosystem time frames differs from agency structures and public desires. One District Ranger observed that ecosystem management has created new "hoops" to complete projects in timely fashion. Potentially, these new hoops could vastly increase the amount of time it takes to complete projects (especially small, inconsequential projects). Both a forest-level Ecosystem Management Coordinator and an NGO executive thought that because of the short length of the Eastside timeline, people are having difficulty figuring out what is happening at any particular point in the ecosystem management process.

A second theme among respondents was that more time and patience is needed to build trust among players and with the public. A forest-level Ecosystem Management Coordinator remarked that scientific approaches are methodical, time-consuming and expensive; therefore, quicker approaches must be developed or expectations regarding appropriate actions within time frames must be lengthened. A tremendous challenge to successful ecosystem management is successfully meshing the extended time frame of nature with the compressed time frame of humans.[239] Human time frames vary from the next quarter view of the corporate planner, to the next election view of the politician, to the discounted future of the economist, to the next rotation view of the forester.[240] Biological time frames differ significantly: from the decades- or centuries-long patterns of forest

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236*See, i.e., id.* § 1501.7; § 1504.
237Keiter, *supra* note 223, at 48.
238*Id.*
239Super, G., *supra* note 105, at 21.
240Rosenbaum, *supra* note 190, at 307.

succession, to annual growth and dormancy cycles, to fire seasons.[241] Legal systems have distinct time frames as well which include hearings, cases, legislation, and implementation.

Natural resource managers developing plans for long-term ecosystem productivity face relentless challenges from the short-term exigencies of economic return, population growth, and political ambitions.[242] Somehow, ecosystem management must coordinate these different time frames in a cohesive manner. Managing ecosystems "requires a change in thinking, a change in basic philosophy, a change in training of resource managers, and most importantly, a change in the short-term economic and political strategies that drive modern society."[243] To be successful, we must expect mistakes and build some flexibility into the law.[244]

15. Managing Expectations

Nine percent of respondents, including mainly Forest Service officers engaged in on-the-ground management, emphasized the importance of managing the public's expectations as the agency proceeds with its ecosystem management plans. A common theme was that, right now, the ecosystem management process is creating higher expectations than may be possible to achieve in the given time frame. Different publics have different expectations. One Forest Supervisor said that the agency should be careful because "human involvement is a double-edged sword -- the public will express its desires but an ecosystem can only support a limited amount of human use." Expectations building up for ecosystem management are off the scale.[245] A forest-level Ecosystem Management Coordinator thought that ecosystem management "will, by definition, create a smaller pie with less to go around for everyone." A District Ranger worried that "the romantic notion of pre-European settlement is unrealistic." Much of the discussion about the virtues of ecosystem management may have already created impossibly high expectations in the

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241 *Id.*

242 Burgess, R.L. *Ecosystems in Space and Time.* Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 81 (November 19-21, 1994).

243 *Id.* at 85.

244 Rosenbaum, *supra* note 190, at 308.

245 Brewer, *supra* note 21, at 144.

minds of politicians and the public.[246] The specter of unattainable goals raises very real problems for those entrusted with ecosystem management responsibilities.[247]

16. The National Forest Management Act (NFMA)

Seven percent of respondents commented that the substantive requirements of NFMA create significant obstacles to implementing a long-term, holistic ecosystem plan. Substantive roadblocks mentioned, and discussed later in this section include: (1) provisions regarding forest regeneration in five years, (2) single agency plan requirements, (3) limits on the size of forest openings, (4) difficulty fitting landscape management into NFMA's structure, (5) viable populations, (6) administrative boundaries of NFMA forest plans, and (7) the requirement that an entire plan be revised all at once every 10-15 years. Other problems cited include an "us against them" mentality in the agency regarding forest plans rather than working toward collaborative, broad plans with joint signatures. One Forest Service respondent recommended no more single agency plans because they are obsolete for ecosystem management. Grumbine (1994) agrees that ecosystem management has developed partially because federal management, through national forest planning, has failed legal challenges, ignored conservation biology concerns, and left the public's expectations for meaningful participation in decisionmaking unfulfilled.[248]

In response to numerous comments citing NFMA's substantive requirements as barriers to ecosystem management, the rest of this section takes a brief look at RPA and NFMA.

a. The Forest and Rangeland Renewable Resources Planning Act of 1974

The Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)[249] required the Forest Service to develop a long-term strategic planning process.[250] RPA

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246 *Id.*

247 *See, i.e., id.*

248 Grumbine, *supra* note 7, at 29.

249 16 U.S.C. § 1600 *et seq.* (1974).

250 U.S. Congress, Office of Technology Assessment, *Forest Service Planning: Setting Strategic Direction Under RPA*, OTA-F-441 (Washington, DC: U.S. Government Printing Office, July 1990).

requires descriptions of the potential National Forest System lands offered for public forest and rangeland resources, goods, and services.[251] However, other than requiring a "systematic interdisciplinary approach" in developing forest plans, RPA included no substantive or procedural guidance for developing the plans, until it was amended by NFMA in 1976.

b. The National Forest Management Act Of 1976

The RPA was followed by the National Forest Management Act of 1976 (NFMA)[252] which reemphasized the importance of multiple-use, sustained-yield management and directed the Forest Service to develop long-term plans to describe how they would meet the purposes of MUSYA.[253] NFMA requires the Forest Service to plan on a forest level and consider:

> the economic and environmental aspects of various systems of renewable resource management, including the related systems of silviculture and protection of forest resources, to provide for outdoor recreation (including wilderness), range, timber, watershed, wildlife, and fish.[254]

Thus, NFMA ushered in the era of forest planning by imposing detailed planning standards on the Forest Service.

i. NFMA's substantive planning requirements

Several provisions of NFMA contain very specific, substantive requirements that may cause difficulty implementing holistic ecosystem management. Respondent's NFMA concerns related to the following substantive provisions:

Section 6(f)(5) requires the agency to revise forest plans when "conditions in a unit have significantly changed, but at least every fifteen years."[255] Two survey respondents

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251 Jensen and Everett, *supra* note 179, at 7.
252 16 U.S.C. §§ 1600-1617 (1988 & Supp. IV 1992).
253 Jensen and Everett, *supra* note 179, at 7.
254 16 U.S.C. § 1604(g)(3)(A) (1988 and Supp. IV 1992).
255 16 U.S.C. § 1604(f)(5) (1988 and Supp. IV 1992).

thought that the revision requirement erected a barrier to the ecosystem management process because the regulations[256] require development of a brand new plan all at once whereas ecosystem management represented a more adaptive, evolving management scheme.

Section 6(g)(3)(E)(ii) only allows timber harvesting where "there is assurance that such lands can be adequately restocked within five years after harvest."[257] Two respondents thought that this restocking requirement was generally quite difficult to achieve and could present problems for broad, holistic management schemes.

Section 6(g)(3)(F)(iii) requires that "cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain."[258] The regulations establish limits on the amount of edge areas and the size of openings allowed. One respondent thought these regulations would be difficult to satisfy in a larger ecosystem management context.

The implementing regulations only allow single agency plans which stop at administrative boundaries. Two respondents noted that ecosystem management plans will include multiple agencies and extend beyond national forest boundaries. They thought that landscape management would be difficult to fit into the existing NFMA planning structure.

One respondent thought NFMA's diversity requirement would limit flexibility in ecosystem management planning. Section 6(3)(g)(B) of NFMA explicitly requires the Forest Service to maintain biological diversity by stating that national forest system management shall:

> provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives, and within the multiple-use objectives of a land management plan adopted pursuant to this section, provide where appropriate, to the degree practicable, for steps to be taken to preserve the diversity of tree species similar to that existing in the region controlled by the plan.[259]

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[256] 36 C.F.R. § 219 (1993).
[257] 16 U.S.C. § 1604(g)(3)(E)(ii) (1988 and Supp. IV 1992).
[258] *Id.* § 1604(g)(3)(F)(iii).
[259] *Id.* § 1604(g)(3)(B).

Thus, NFMA clearly requires the Forest Service to maintain biotic diversity while still supplying timber and other resources of great significance to people.[260]

Although some of NFMA's prescriptive requirements may make ecosystem management planning difficult, the Act's non-specificity in other areas may allow managers to build flexibility into the planning process. For example, NFMA's diversity requirement is deliberately non-specific leaving much room for individual interpretation.[261] The law provides little guidance regarding what diversity is and how much is required.[262] However, the regulations adopted to fulfill this statutory mandate require the consideration of conservation biology concepts in the forest planning process.[263] These regulations require the Forest Service to select indicator species as measures of forest health and biodiversity. The spotted owl is an indicator species and the current crisis is partially a reflection of that status. In fact, some courts have interpreted the diversity provision as merely a procedural requirement that planners consider the impact of proposed activities on biological diversity.[264]

ii. NFMA and public participation

NFMA section 6(d) requires public participation "in the development, review, and revision of land management plans. . . ."[265] Section 6(a) requires the Forest Service to "coordinate" its land and resource management plans with other federal agencies.[266] NFMA also requires that the planning process for the national forests include interdisciplinary teams, economic analyses, and citizen participation.[267] NFMA

260Salwasser, H., J.W. Thomas, and F. Samson. *Applying the Diversity Concept to National Forest Management.* In: Cooley, J.L. and J.H. Cooley, eds., Natural Diversity in Forest Ecosystems, Proc. of the Workshop, Athens, GA, p. 60 (1984).

261Peterson, R.M. *Diversity Requirements in the National Forest Management Act.* In: Cooley, J.L. and J.H. Cooley, eds., Natural Diversity in Forest Ecosystems, Proc. of the Workshop, Athens, GA, p. 22 (1984); MacCleery, D. *Diversity, Multiple Use, The NFMA, and the Land Ethic.* In: Cooley, J.L. and J.H. Cooley, eds., Natural Diversity in Forest Ecosystems, Proc. of the Workshop, Athens, GA, p. 28-30 (1984).

262Peterson, *supra* note 261, at 22.

263*See* 36 C.F.R. §§ 219.19; 219.27(g); 219.1(3) (1993).

264*See* Sierra Club v. Robertson, 810 F. Supp. 1021 (W.D. Ark. 1992).

26516 U.S.C. § 1604(d) (1988 & Supp. IV 1992).

266*Id.* § 1604(a); 36 C.F.R. § 219.7 (1986).

267Kennedy, J.J. and T.M. Quigley. *Evolution of Forest Service Organizational Culture and Adaption Issues in Embracing Ecosystem Management.* In: Jensen, M.E. and P.S. Bourgeron, eds. Eastside Forest Ecosystem Health Assessment --

encourages integrating the public into the decisionmaking process early and often to resolve conflicts.[268]

But, much of the public sentiment today is that the Forest Service has not used public input efficiently or effectively in its planning process.[269] Current criticism often mirrors complaints from 20 years ago: the agency asks for public input, but the input does not affect final decisions.[270] The Office of Technology Assessment (OTA) lists four main reasons for the ineffective involvement of the public in the planning process: "use of incorrect models of public involvement, lack of information on how to involve the public, professional resistance to the public's ideas, and inflexible conditions for managers."[271] The OTA concluded that "most national forest managers still fail to recognize the purpose of public involvement , believing public participation is primarily an exercise in gathering information."[272] Perhaps, a lack of expertise on the part of the agency managers and group facilitators regarding involving the public in a meaningful way is at the root of the ineffective public planning process and the respondents' NFMA concerns.

17. Different Organic Mandates Of Public Agencies

The major public land management agencies -- the National Park Service (NPS), the United States Forest Service (USFS), the Bureau of Land Management (BLM) and the United States Fish and Wildlife Service (USFWS) -- must comply with the different mandates found in their respective organic acts. As noted by 6% of the interview respondents, the dissimilar organic mandates of the public land agencies create regulatory uncertainty for any broad, holistic management scheme implemented across the ecological landscape. One respondent thought that analysis of organic mandates is complicated by the fact that each mandate must be evaluated within the context of subsequent legislation that also govern the activities of the agencies. Land managers responsible for actually implementing land management practices were concerned that this regulatory environment sent them mixed signals regarding proper legal authority for their actions.

Volume II: Ecosystem Management Principles and Applications, USDA Forest Service, PNW Research Station, Portland, OR, p. 28 (1994).

[268]U.S. Congress, *supra* note 167, at 4.

[269]*Id.*

[270]*Id.*

[271]*Id.*

[272]*Id.*

The organic mandates of the four major public land management agencies may constrain their attempts to implement ecosystem management. Both the Forest Service and the BLM have multiple-use mandates that include traditionally favored resource extraction and production activities.[273] To the Forest Service, ecosystem management means maintaining a steady flow of timber and other resources while maintaining long-term forest health.[274] In contrast, the U.S. Fish and Wildlife Service focuses on maintaining wildlife expectations for hunters and fishermen.[275] To the Park Service, ecosystem management means allowing natural processes to occur on a larger scale, while also accommodating park visitor needs and protecting neighboring land owners.[276] These four major public land management agencies have not focused on the ecological needs of the landscape in a consistent manner in the past. Thus, the transition to holistic ecosystem management plans that include lands administered by each of them may prove difficult.

Although agency planners recognize that they must plan across agency boundaries, they are reluctant to enter any interagency agreement that might compromise their own ability to meet other legally-mandated resource policy goals.[277] The current law provides no mechanism by which the various agencies can confidently make value judgments between conflicting statutory responsibilities in pursuit of ecosystem management. Without clear leadership, many managers feel hampered by these conflicting duties. However, the ambiguous mandates may also provide opportunities for local-level ecosystem plans by maverick, aggressive land managers.

Coordinating activity between USFS and NPS is further hampered by the agencies' institutional evolution, and long-standing bureaucratic rivalry.[278] The basic differences in mandate, mission, and experience make it difficult for USFS and NPS managers to look at cumulative effects of management decisions across administrative boundaries or even to track long-term change within their own areas of control.[279] A difficult legal issue is how to reconcile fundamentally different legal mandates and policies when management decisions are likely to have adverse environmental or economic impacts on nearby

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[273]Multiple-Use Sustained-Yield Act of 1960, 16 U.S.C. § 528 (1988); Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1712(c)(1) (1988).
[274]Keiter, *supra* note 13, at 303.
[275]16 U.S.C. § 1 (1988) (Nat'l Park Service); 16 U.S.C. § 668dd(d)(1)(A) (1988) (Nat'l Wildlife Refuge System).
[276]Keiter, *supra* note 13, at 303.
[277]*Id.*
[278]Goldstein, *supra* note 81, at 184; Goldstein, *supra* note 145, at 298.
[279]Goldstein, *supra* note 81, at 184.

resources, lands, and communities.[280] Due to these concerns, the remainder of this section offers a brief description of the organic mandates and significant subsequent legislation for each agency.

a. The legal framework for the Forest Service

i. The Forest Service Organic Act

Forest legislation in the United States began with the Forest Reserve Act of 1891 which gave the President the authority to reserve any public domain lands "wholly or in part covered with timber or undergrowth. . . ."[281] That authority was narrowed by the Organic Administration Act of 1897[282] which defined the circumstances under which public land could be reserved:

> No public forest reservation shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States.[283]

In 1911, the United States Supreme Court ruled that the Organic Act granted the Forest Service broad regulatory jurisdiction over the "occupancy and use" of the forest reserves.[284] Since 1911, courts have consistently interpreted the Organic Act's occupancy and use language as granting the agency broad regulatory and management authority over the national forest lands.[285]

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[280]Keiter, R.B. *An Introduction to the Ecosystem Management Debate*. In: Keiter, R.B. and M.S. Boyce, eds., The Greater Yellowstone Ecosystem: Redefining America's Wilderness Heritage. New Haven, CT, Yale University Press, p. 9 (1991).

[281]16 U.S.C. § 471 (1891); repealed by Federal Land Policy and Management Act of 1976, 43 U.S.C. §§ 1701-1784 (1988).

[282]16 U.S.C. § 473-482 (1897).

[283]*Id.* § 475.

[284]United States v. Grimaud, 220 U.S. 506, 522 (1911).

[285]U.S. Congress, *supra* note 167, at 60-61.

ii. The Multiple Use-Sustained Yield Act of 1960

The Multiple Use-Sustained Yield Act of 1960 (MUSYA)[286] expanded the "improve and protect the forest" part of the agency's organic mandate by requiring it to administer the national forests for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes."[287] In addition to recognizing the principles of multiple use and sustained yield,[288] MUSYA clarified the agency's mission and established for the first time a statutory basis for the concept of integrated resource management.[289] Although MUSYA provided the Forest Service with a multiple use mandate and reaffirmed the agency's broad discretion, it offered no guidance on how to balance the forests' various resources or determine the appropriate mix of uses.

iii. The Wilderness Act of 1964

Congress formally established wilderness preservation as a Forest Service responsibility with the passage of the Wilderness Act of 1964.[290] The Wilderness Act restricted Forest Service management discretion by dictating that some areas within the national forest system would be "used for less than all the resources."[291] Once Congress has designated a segment of national forest land as wilderness, the Forest Service must

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[286]16 U.S.C. §§ 528-531 (1988).

[287]16 U.S.C. § 528 (1988).

[288]Section 4 of MUSYA (16 U.S.C. § 531) defines key terms:

"Multiple use" means: The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

"Sustained yield of the several products and services" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land.

[289]U.S. Congress, *supra* note 245, at 61.

[290]16 U.S.C. §§ 1131-1136 (1988).

[291]Jensen and Everett, *supra* note 179, at 7.

adjust its management philosophy by disregarding its otherwise governing multiple-use mandate and limiting development activity within the designated area.[292] Thus, a wilderness designation requires preservation as the main management objective; an objective that differs from the multiple-use lands. Since the Forest Service is usually responsible for lands surrounding designated wilderness areas, it has the authority to control most activities that might threaten its own wilderness. Thus, the Forest Service faces the problem of conflicting legal authorities between its multiple-use mandate and its commitment to wilderness protection.[293]

The Wilderness Act contains an explicit preservation mandate by imposing a general legal duty on the Forest Service to manage wilderness "so as to preserve its natural conditions."[294] To achieve that goal, the Act expressly prohibits commercial enterprise, roads, motorized equipment, and structures.[295] However, the Act also contains a number of exceptions including preexisting motorboat and aircraft access; fire, insect and disease control measures; wilderness-compatible mineral prospecting and activities under valid existing mineral rights; reasonable livestock grazing; Presidentially-authorized water projects; and commercial services for proper wilderness activities.[296]

In the recent past, wilderness designation has been the battleground between preservation and multiple-use proponents. Many roadless areas in national forests are still locked up from any development due to the RARE II study. In Montana and Idaho, Congress has still not completed its wilderness designation process, leaving the management status of roadless, multiple-use forest lands up in the air.[297] Courts have ruled that the Forest Service is obligated under the Wilderness Act to avoid any actions on roadless lands until their wilderness suitability is evaluated and it is determined whether to add them to the wilderness system.[298] Because designated wilderness lands are removed from multiple-use management, environmental groups favor designation of roadless areas as the most effective means within the existing legal framework for preserving ecological

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[292] Keiter, *supra* note 10, at 17.

[293] *Id.* at 18

[294] 16 U.S.C. §§ 1131(c), 1133(b) (1988).

[295] *Id.* § 1133(c).

[296] *See, Id.* § 1133(d)(1-8).

[297] Keiter, *supra* note 180, at 938.

[298] *See, i.e.*, 16 U.S.C. § 1132(b); Northwest Indian Protective Ass'n v. Peterson, 565 F. Supp. 586 (N.D.Cal. 1983), *aff'd* 795 F.2d 688 (9th Cir. 1986), *rev'd on other grounds*, 108 S.Ct. 1319 (1988); Getty Oil Co. v. Clark, 614 F. Supp. 904, 919 (D. Wyo. 1985); *California v. Bergland*, 483 F. Supp. 465 (E.D. CA 1980), *aff'd sub. nom.*, California v. Block, 690 F.2d 753 (9th Cir. 1982); Parker v. United States, 448 F.2d 793 (10th Cir. 1971).

integrity.[299] Two private industry executives commented that ecosystem management may be hindered by the requirement that all roadless lands be evaluated for their wilderness potential before management plans may be authorized on them.[300] Of course, considering lands for wilderness designation may also be construed as a less damaging method for determining the future of a given land base compared to moving forward with development plans that permanently alter the landscape.

iv. Other laws

The National Environmental Policy Act (NEPA), the Forest and Rangeland Renewable Resources Planning Act (RPA), and the National Forest Management Act (NFMA) are discussed in other sections of this paper.

b. The Bureau of Land Management's organic mandate

Prior to 1976, the Bureau of Land Management (BLM) was without an official authorizing statute or reliable funding. Established by Executive Reorganization in 1946,[301] the BLM was generally ignored by Congress and the general public.[302] Congress officially established the BLM with the passage of the Federal Land Policy and Management Act of 1976 (FLPMA),[303] which instructs the BLM to manage the public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values . . . ."[304] FLPMA authorized the BLM to manage approximately 350 million acres of public lands to achieve "multiple use values."[305] FLPMA defines multiple use as follows:

> The term "multiple use" means the management of the public lands and their various resource values so that they are utilized in the combination that will

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299 Keiter, *supra* note 180, at 984.
300 *See*, National Forest Management Act, 16 U.S.C. § 1604(e)(1) (1988).
301 Reorg. Plan No. 3 of 1946, 3 C.F.R. 1065-73, *reprinted in* 5 U.S.C. app., at 726 (1976).
302 Achterman, G.L. and S.K. Fairfax. *The Public Participation Requirements of the Federal Land Policy and Management Act.* 21 ARIZ. L. REV. 501 (1979).
303 43 U.S.C. §§ 1701-1784(1988).
304 *Id.* § 1701(a)(8).
305 *Id.* § 1732(a); *see also, id.* § 1701(a)(7); § 1712(c)(1).

> best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural, scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

This multiple-use concept appears in several sections of the Act: in the statement of policy,[306] in the development of land use plans,[307] and in the requirements for managing public lands.[308] Similar to the Forest Service, the BLM's multiple use mandate includes little guidance regarding an appropriate mix of resources and uses. Of course, ambiguity may translate into flexibility for an aggressive ecosystem management planner.

c. The Park Service's organic mandate

The National Park Service Organic Act of 1916 established the National Park Service and required it to administer the national park system to conserve the scenery, natural and historic objects, and wildlife, and to provide for the public enjoyment, while ensuring that the parks are left "unimpaired for the enjoyment of future generations."[309] In 1978, in response to a court finding that the Park Service failed to protect Redwood National Park from harmful logging on adjacent land,[310] Congress amended the Organic

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306 *Id.* § 1701(a)(7).
307 *Id.* § 1712(c)(1).
308 *Id.* § 1732(a).
309 16 U.S.C. § 1 (1988).
310 *See* Sierra Club v. Andrus, 487 F. Supp. 443 (D. D.C. 1980); Keiter, *supra* note 10, at 19.

Act to clarify the Park Service's mission: "the protection, management and administration of [national parks] shall be conducted in light of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established. . . ."[311] Courts have interpreted this amendment to the Organic Act "as imposing an absolute duty on park officials to protect park resources from threatening activities, regardless of the source of the threat or the nature of competing user claims."[312]

According to one analyst, this mandate, when considering legislative history, "imposes a clear responsibility on Park Service officials to respond to threatening activities, whether internal or external to the parks, and to view their resource management responsibilities on an ecosystem scale."[313] In fact, the courts have upheld Park Service regulations that affect state and private property located within park boundaries.[314] The Supreme Court has even upheld a federal statute that protects federal land by regulating activity on nonfederal property.[315] Thus, the Park Service operates under a very strong preservationist mandate.

However, the Park Service clearly does not have an explicit ecosystem management mandate and, due to the many political pressures it constantly encounters, may be reluctant to wholeheartedly embrace ecosystem management without some type of compelling statutory reason. Furthermore, courts may have difficulty enforcing ecosystem management decisions without legislation to support their analyses. The relationship between the Forest Service and the Park Service is crucial because national forests lands neighbor or surround national park lands throughout the West.[316]

d. The U.S. Fish and Wildlife Service's organic mandate

The Fish and Wildlife Coordination Act of 1934[317] establishes a threefold purpose for the United States Fish and Wildlife Service (USFWS):

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[311] 16 U.S.C. § 1a-1 (1988).

[312] *See* Sierra Club v. Andrus, 487 F. Supp. 443 (D. D.C. 1980); National Rifle Ass'n v. Potter, 628 F. Supp. 903 (D. D.C. 1985).

[313] Keiter, *supra* note 13, at 305.

[314] *See* Free Enterprise Canoe Renters Ass'n v. Watt, 711 F.2d 852 (8th Cir. 1983); United States v. Brown, 552 F.2d 817 (8th Cir. 1977), *cert. denied*, 431 U.S. 949 (1977).

[315] Kleppe v. New Mexico, 426 U.S. 529 (1976).

[316] Sax and Keiter, *supra* note 9, at 215.

[317] 16 U.S.C. §§ 661-67 (1988).

(1) to cooperate with other agencies and private organizations to develop, protect, rear, and stock all species of wildlife, control wildlife loss from disease or overabundance, and provide shooting and fishing areas;
(2) to survey and investigate the wildlife on public lands; and
(3) to accept donations of land and money contributions.[318]

A significant portion of the USFWS responsibilities include management of hunting and fishing areas for sportsmen. In addition, the National Wildlife Refuge Administration Act[319] consolidated responsibility for conservation of fish and wildlife species under the USFWS. These conservation responsibilities include species "threatened with extinction" and administration of the "National Wildlife Refuge System."[320] Thus, the USFWS also has significant ESA enforcement responsibilities. Similar to the other agencies, the clearly mandated responsibilities of the USFWS may limit its ability to meaningfully collaborate in management decisions.

e. The confusing mix of organic mandates

The complex web of different organic mandates and laws governing agency actions raises a number of concerns. First, the laws were enacted at different times over a century-long period and serve different, and often contradictory purposes. Nonetheless the agencies must abide by them. Second, the many conflicting requirements make comprehensive ecosystem management planning an exceedingly difficult task. Third, the complexity of the legal framework, as noted by respondents in this survey, may lead agency officials to concentrate on making their management plans "bomb-proof," rather than spending time working with the public toward implementation of reasonable ecosystem management plans.

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318 *Id.* § 661.
319 *Id.* §§ 668dd-668ee.
320 *Id.* § 668dd.

18. Monitoring

Six percent of the respondents noted the need for methods to measure the success and effectiveness of ecosystem management satisfactory to all parties. Problems mentioned included a lack of baseline data, limited past involvement in information collection (i.e. vegetative information), poor records management, a lack of historical information, and the need for more money dedicated exclusively to project assessment. "The Forest Service gives monitoring a low priority because monitoring does not provide tangible outputs for which the managers can be rewarded and because the agency lacks penalties for inadequate monitoring."[321] Boyle and Shannon (1994) found that Forest Service employees believe monitoring of resource actions will strengthen management accountability, even though it might somewhat strain manager-scientist relations.[322]

The success of ecosystem management will be difficult to monitor due to an absence of common standards of measurement among agencies.[323] Also, ecosystem function is difficult and expensive to measure.[324] Establishing a good foundation of baseline information on resources and people is critical.[325] Without baseline data on ecosystem components, as well as a method to uniformly employ this information, managers will continue to be unable to develop effective cooperative research management plans.[326] The lack of research and data integration constrains efforts to assess cumulative effects.

Obstacles to ecosystem management are created by our lack of "basic knowledge about the biophysical environment; about socioeconomic characteristics of associated peoples, societies, and economies; and especially about the interactions of the two and the dynamics of the total system."[327] "For any ecosystem, a critical step is developing adequate understanding of the state and dynamics of the ecological and institutional aspects of the ecosystem to specifically determine the character and roots of obstacles to more

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321U.S. Congress, *supra* note 167, at 12.
322Boyle and Shannon, *supra* note 20, at 7.
323Goldstein, *supra* note 81, at 185.
324Roberts, *supra* note 14, at 78.
325Agee and Johnson, *supra* note 11, at 230.
326Goldstein, *supra* note 81, at 185.
327Slocombe, *supra* note 5, at 617.

sustainable management."[328] Managers must track the effects of their actions so that success and failure may be evaluated quantitatively.[329]

Achievement of integrated management is often handicapped by planning and management actions that do not include research and monitoring as integral components.[330] There is quite a bit of disharmony between data sets that cross administrative boundaries.[331] Other "barriers to coordination of resource assessments include data gaps, institutional limitations, political obstacles, budget restrictions, and the timing of the assessments."[332] Better data bases generated through interagency cooperation would improve the outlook for accurate forecasting on a less insular and more integrated basis.[333]

Agee and Johnson (1992) have included the following general management, planning, and communication issues as critical to ecosystem management:

- Consensus among affected parties on the specific indicators of desired conditions, benefits, minimum acceptable standards, or constraints to activities. Limit to ten or less indicators.
- Clarity of goals regarding optimum mix for increased production of certain benefits, goods, and services on a sustainable basis.
- Monitoring of both people and indicators relative to goals, costs, risks, and values.
- Quantification of indicators in units measurable over space and time.
- A systematic process to assess effectiveness of management plans after implementation.
- Criteria for management planning success that reflect an agreed upon balance of outcome measures such as efficiency, equity, accountability, effectiveness, sustainability, and adaptability.
- Analysis of trends, risks and potentials for each indicator.[334]

"Ecosystem management requires more research and data collection (i.e. habitat inventory/classification, disturbance regime dynamics, baseline species and population

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328*Id.*
329Grumbine, *supra* note 7, at 31.
330Slocombe, *supra* note 5, at 617.
331Goldstein, *supra* note 145, at 303.
332Parry, B.T. *Barriers to Coordinating Federal and State Resource Assessments in California.* 81(8) JOURNAL OF FORESTRY 541, 542 (August 1983).
333Agee and Johnson, *supra* note 11, at 226.
334*Id.* at 230.

assessment) as well as better management and use of existing data."[335] Research in ecosystem-level economics and social ecology has also been lacking.[336] Inventories of ecosystems and their condition should include the social context, recreational uses, human dependencies, special places, and other dimensions of human history, current situations and demands.[337] These indicators will become increasingly important as population continues to grow and exerts more pressure on natural systems.[338] Underlying science for ecosystem analysis may be lacking or not yet being applied.[339]

The absence of common standards of measurements among management units creates another problem.[340] For example, between the states and the federal government in the Yellowstone region, there are five different sets of criteria for identifying rare and endangered species.[341]

19. Air and Water Quality Laws

Just four percent of respondents brought up air and water quality laws[342] as a potential barrier to ecosystem management, but they each raised the same, interesting point. Ecosystem management, to simulate natural ecological conditions, may require some prescribed burning. Even if these burns initially have public support, once people realize that their air or water must temporarily become dirty, they no longer will support the practice. Both managers thought this problem will be most acute in forests near urban centers. They also thought that the problems will be compounded in areas where air and water quality already barely comply with legal standards.

The managers concerns also find support in the scientific community. The scientific community has increasingly recognized that managers must, to the extent feasible, simulate fire regimes that historically molded plant communities to sustain the diversity of life originally associated with an area.[343] These efforts may run afoul of clean air and

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335Grumbine, *supra* note 7, at 31.
336Goldstein, *supra* note 145, at 304.
337Super, *supra* note 105, at 28.
338*Id.*
339Clark and Harvey, *supra* note 67, at 283.
340Goldstein, *supra* note 145, at 304.
341*Id.*
342Clean Water Act, 33 U.S.C. §§ 1251-1376; Clean Air Act, 42 U.S.C. §§ 7401-7626.
343Van Lear, D.H. *Integrating Structural, Compositional, and Functional Considerations into Forest Ecosystem Management.* Proceedings of a

water laws. For example, some analysts believe that the effects of airborne pollutants and external manipulation of surface water quality and quantity constitute the principle external threats to national park ecosystems.[344]

Probably the group surveyed, consisting mainly of land managers, is not intimately familiar with air and water quality standards. Both the air and water quality laws are built upon an individual pollution source framework. This single source set-up may make it difficult to do area-wide planning and adaptive adjustment to holistic management schemes.

20. Constraints of State and Tribal Law

Although only four percent of the total respondents mentioned state laws as a barrier, the percentage consisted entirely of BLM planners. One thought that the differences between federal and state water laws raised difficulties for large-scale ecosystem planning, especially in Idaho where he perceived that the state legislature did not want any prescriptions on its water use decisions. Another BLM planner mentioned that public lands in Arizona are required by state law to be managed for the highest return. He thought this state legal constraint makes partnership formation quite difficult.

In addition, participants in a work group session at a recent ecosystem management conference expressed concern about the effect of ecosystem management on inheritance taxes.[345] For example, in Montana there is a great discrepancy between property tax on forest land and residential land. Often, inheritors of small tracts of forested land which qualify as residential parcels need to sell some of the timber on the land to afford the large inheritance tax. These private owners are concerned that ecosystem management might prevent cutting that is necessary for them to keep their family land.

In regard to Indian tribes, both BLM respondents mentioned that collaborative efforts are quite difficult to implement because of the "quasi-legal" reservation boundaries past which the government has little leverage to compel the tribes to cooperate.

Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 117 (November 19-21, 1991).

[344]Stottlemeyer, R. *External Threats to Ecosystems of U.S. National Parks.* 11 ENV. MGMT. 87, 88 (1987).

[345]Comments at Forest Policy Center conference: *Building Partnerships for Ecosystem Management on Forest and Range Lands in Mixed Ownership.* Northern Rockies Regional Workshop (July 7-9, 1994).

A final concern is that the legal framework governing federal planning and management of national forests recognizes state responsibility for water rights and for fish and wildlife.[346] The Forest Service Organic Act requires:

> All waters within the boundaries of forest reserves may be used . . . under the laws of the State wherein such reserves are situated. . . .[347]

MUSYA also implies state jurisdiction over national forest waters: MUSYA is "supplemental to, but not in derogation of, the purposes for which the national forests were established" as set forth in the Organic Act.[348] In addition, MUSYA expressly grants authority over fish and wildlife to the States:

> Nothing herein shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish on the national forests.[349]

NFMA also implicitly grants the States authority over waters and wildlife in the national forests when it directs that national forest planning remain consistent with MUSYA.[350] Thus, legitimate barriers to ecosystem management may arise from conflicts with state law especially in regard to water use in the arid, overappropriated West.

IV. RECOMMENDATIONS

Offering comprehensive solutions to the barriers to ecosystem management is beyond the scope of this paper. However, this recommendations section highlights some general themes to begin to address the barriers. These recommendations are based on comments by respondents and our observations throughout the survey. Boyle and Shannon succinctly identify the dual legal and institutional nature of ecosystem barriers: "Just as ecosystem management is inhibited by policies, organizational structure, and legal

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346U.S. Congress, *supra* note 167, at 101.
34716 U.S.C. § 475 (1897).
34816 U.S.C. § 528 (1960).
349*Id.*
350U.S. Congress, *supra* note 167, at 101.

impediments, interdisciplinary approaches are similarly inhibited by the attitudes and values of the organization."[351]

1. Provide Ecosystem Management Training for Agency Personnel

A common theme among respondents is a desire for more training explaining ecosystem management principles and emphasizing the importance of public involvement. Academics generally agree that training is a key component in the transition to ecosystem-based management. Agency transition to ecosystem management will require education of both the public and agency personnel.[352] Agee and Johnson propose interagency training at three levels: (1) regional directors, regional foresters, Washington office, (2) regional staff, and (3) unit and interunit representatives.[353] Kennedy and Quigley (1994) recommend developing interdisciplinary training (and employee classification) that transcends tradition range, recreation, or hydrology functional boundaries.[354] Their recommendations include the following prongs:

> • Ensure that before any specialized training is undertaken by Forest Service employees on specific ecosystem functions or output endowments (e.g., fisheries, soils, or range), a series of general courses should be taken that address socioeconomic, planning and management, and ecosystems in a broad, integrated ecosystem management manner. Advanced training in certain ecosystems (e.g. stream ecology) or output and user delivery and management systems (e.g., recreation, fisheries, or range output services) could then be offered.
> • Develop ecosystem management certification with the rigor, respect, and responsibility of the Forest Service certified silviculturalist program.[355]

Super et al. agree that if people with social science skills are not directly involved, ecosystem management will not adequately consider the human dimension.[356] Magill

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351 Boyle and Shannon, *supra* note 20, at 11.
352 Agee and Johnson, *supra* note 11, at 229.
353 *Id.* at 229-31.
354 Kennedy and Quigley, *supra* note 267, at 23.
355 *Id.*
356 Super et al., *supra* note 105, at 28.

(1991) concurs as well: "Positive change in resource professional skills and attitude might come through improved career guidance, more training in the social science, and increased exposure to alternative solutions."[357]

2. Evaluate Agency Culture

Both agency personnel and private industry executives strongly believe that the resource professionals and the agencies must continue to emphasize the importance of involving people in ecosystem management. "Ecosystem management begins with the assumption that current crises are largely political and social in origin, that people inside and outside the agency seek more involvement in decisionmaking, and that forest management today is about who gets what, winners and losers, and politics."[358] The political role must be recognized. Foresters must learn to think strategically to anticipate the future.[359] Forest resource managers must become skilled facilitators of ongoing civic deliberation.[360]

A study by Shannon (1987) of six western forests involving interviews of agency staff and local citizens found five factors strongly related to the development of local culture and forest planning norms:

1. Management style of the forest supervisor,
2. Relationship of decision-making personnel on the forest to the planning process,
3. Social environment of the local communities involved in the planning process,
4. Organization of the forest staff,
5. Presence of individuals in the agency and public who grasp the essential qualities and value of public dialogue.[361]

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[357]Magill, *supra* note 96, at 17.
[358]Shepard, *supra* note 111, at 30.
[359]Shannon, *supra* note 125, at 27.
[360]*Id.*
[361]Shannon, *supra* note 107, at 240 .

3. Embrace a Flexible Management Philosophy

A common theme among the ecosystem coordinators and BLM planners is that the agencies must embrace a flexible management philosophy. One commented that "managers must understand their facilitation role and embrace the new management philosophy. One Regional Social Science Coordinator recommended not trying to attack management problems "barrier by barrier" but rather "to get on with ecosystem management by developing a vision and immediately starting to apply it to real problems." A BLM planner agreed, saying that "action should start right away with short-term measures (stop-gaps) while the long-term is being figured out." Others agreed on the basic concept of doing preventative work now with an eye toward long-range planning and goals. Another Regional Social Science Coordinator recommended "loosening up the organization, and giving more voice to managers." A theme among respondents was to embrace a management philosophy like adaptive management. Allow people to dig into issues, make mistakes and pass that information on to others. Others recommended keeping everyone involved in the process and learning. Other ideas were that agencies should not direct working groups, instead "let counties and private parties direct, with agencies providing staff, money, input, and direction." Another idea was to increase cooperation through use of "Memorandums of Understanding" between different management entities. Boyle and Shannon (1994) suggest an organizational policy stating that the Forest Service will synthesize the knowledge of a diverse workforce into everyday decisions.[362]

Another common theme among respondents was that the agencies should fully adopt an adaptive management strategy. Adaptive management embraces uncertainty in both ecological and social systems. Uncertainty requires that management be treated as a continual learning process and that management decisions be recognized as "gambles."[363] The Forest Service requires a more fully integrated and adaptive management process.[364] "Adaptive management assumes that scientific knowledge is provisional and focuses on management as a learning process or continuous experiment where incorporating the results of previous actions allows managers to remain flexible and adapt to uncertainty."[365]

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[362]Boyle and Shannon, *supra* note 20, at 11.

[363]Cortner and Moote, *supra* note 2, at 315, *quoting* Walters, C.J. 1986. *Adaptive Management of Renewable Resources*. McGraw-Hill, New York (1986).

[364]Agee and Johnson, *supra* note 11, at 21.

[365]Grumbine, *supra* note 7, at 31; *see also*, Walters, C.J. *Adaptive Management of Renewable Resources*, New York, NY, MacGraw-Hill (1986); Holling, C.S. (ed.). *Adaptive Environmental Assessment and Management*, New York, NY,

Another way to develop new management styles and increase public involvement is through consensus-building processes. One promising technique is collaborative learning.[366]

4. Modify Planning Processes

Change the RPA and forest planning from its output-centered focus (within sustained-yield constraints) to a desired sustainable ecosystem model that secondarily estimates outputs.[367] Shift the traditional administrative boundaries in National Forest planning units to landscape ecosystem criteria. Base the planning on development of desired future conditions and work backwards from there.

Former Chief of the Forest Service Dale Robertson's June 4, 1992 letter implies that the Forest Service is evolving from a commodity orientation to one with greater attention toward other values (i.e. sustainable ecosystems, recreation, wildlife species preservation, aesthetics, cultural and spiritual values).[368] Commodity production will remain important, but it will not always be the dominant reason for managing the land.[369]

Many recommendations have been made to change agency incentives away from commodities production. Suggestions include eliminating the increase in funding tied to timber harvesting on marginal lands, keeping a portion of the recreational user fees within the budget of the forest that collects them, and increasing grazing fees.[370]

John Wiley & Sons (1978); Everett, R., C. Oliver, J. Saveland, P. Hessburg, N. Diaz, and L. Irwin. *Adaptive Ecosystem Management*. In: Jensen, M.E. and P.S. Bourgeron, eds. Eastside Forest Ecosystem Health Assessment -- Volume II: Ecosystem Management Principles and Applications, USDA Forest Service, PNW Research Station, Portland, OR, p. 28 (1994).

[366]For information about collaborative learning, *see* Walker, G.B. and S.E. Daniels, *Collaborative Learning and the Mediation of Natural Resource Disputes*, A paper presented at the annual meeting of the Speech Communication Association, Miami Beach, FL (November 20, 1993); Daniels, S.E. et al. *Managing Ecosystems and Social Conflict*, Forest Service Northwest Experiment Station (March 5, 1993).

[367]Kennedy and Quigley, *supra* note 264, at 23.

[368]Super et al., *supra* note 105, at 22.

[369]*Id.*

[370]Goldstein, *supra* note 145, at 316.

5. Restructure Budget Process and Change Allocation of Agency Funds

A common theme, summarized by a Forest Supervisor, is that the agency "needs to develop an understanding that functionalism is hurting forest management." The agency must change its budget emphasis from output-based to a system enhancing ecosystem management. A common suggestion was to emphasize desired future conditions rather than output levels. Another was to earmark certain funds specifically for ecosystem management. Kennedy and Quigley suggest the following:

> • Increase sensitivity of budgets and accountability to the decade time frame of ecosystem adaptation and change.
> • Allow a small percentage of budgets (say 10 percent) to be used for innovative, experimental options (fully documented), without traditional sanctions for failure to efficiently achieve stated objectives.[371]

On the national scale, USFS incentives for forest management that are linked mostly to timber production must change. Proposals for change include eliminating the connection between agency budget increases and timber harvesting on marginal lands, allowing a percentage of increased recreational fees to remain with the forest, and reducing congressional pressure to cut a certain number of board feet per year.[372] "The combination of pleas for budget and organizational restructuring . . . is a powerful cross-agency cry for change in the purpose and manner in which dollars are used."[373]

6. Change Agency Incentives

A common theme among respondents was that the Forest Service must change its incentive structure. The agency needs to reward innovation and risk-taking but the system is just not set up to do that now. The Forest Service's current structure has "helped create target-based policies that complicate, if not make ecosystem management impossible; and it has established management incentives based on controlling information, rather than on

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[371]Kennedy and Quigley, *supra* note 267, at 23.
[372]Goldstein, *supra* note 81, at 186.
[373]Boyle and Shannon, *supra* note 20, at 10.

opening lines of communication that lead to informed decisions."[374] Because ecosystem management is a flexible, adaptive, innovative, interdisciplinary process, those ideals must be instilled and encouraged in individuals trying to implement it. Ecosystem management's goal is a certain desired future condition not based entirely on output. The system must encourage progress toward that ephemeral goal by rewarding innovative management, consensus-building, teamwork, etc. as well as the traditional, concrete output goals. The system must reward the individuals trying to implement these changes if it hopes to encourage them to do so. Successful ecosystem management needs agency enthusiasm, commitment, rewards and incentives.[375] Effective incentives, rewards and consequences must exist to encourage resource managers to carry out ecosystem management.[376] "Motivation for more active and truthful involvement has to be established in the annual review and reward system."[377]

7. Increase Professional Diversity Within Agencies to Reflect Ecosystem Management Goals

Ecosystem coordinators, in particular, believe that the agency must increase its diversity by hiring professionals with social science skills that reflect the human and public participation elements of ecosystem management. Diversity may breed increased openness to change. Ecosystem management requires a wide range of skills, many of them non-scientific, to be successful. Agencies should strive to match that diversity within their own organizations. An interdisciplinary staff, with both scientific and political skills, will be better suited to implement an interdisciplinary plan like ecosystem management.[378]

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374 *Id.* at 10.

375 Agee and Johnson, *supra* note 11, at 230.

376 Super et al., *supra* note 105, at 25.

377 Boyle and Shannon, *supra* note 20, at 10.

378 *See, i.e.*, Kennedy, J.J. *Integrating gender diverse and interdisciplinary professionals into traditional U.S. Department of Agriculture-Forest Service Culture.* 4(4) SOCIETY AND NATURAL RES. 165 (1991).

8. Redraw Administrative Boundaries

A theme mentioned by six respondents is the politically difficult solution of redrawing administrative boundaries. Congress could integrate ecosystem lands by combining the public lands within the same ecosystem into a single region under one responsible agency.[379] Another approach is to establish a regional authority to conduct research, planning, and zoning for an ecosystem. The regional scale is important to capture cumulative effects and to ensure management includes terrestrial/aquatic linkages and interactions.[380]

9. Restructure Management Units

A more feasible solution, mentioned by four respondents, is to restructure the management units within the existing administrative boundaries. For example, one District Ranger has developed a landscape stewardship model that divides his district into four geographic areas. A separate staff team is assigned to manage each of the different areas. Thus, each officer is tied to a particular geographic land area rather than assigned a particular functional duty. The four geographic teams are supported by a highly trained technical support team. The Park Service is contemplating a similar innovative management set-up with a coordinating office located between Glacier and Yellowstone National Parks.

Precedents to redefine management units to better support integrated environment and development planning include long-standing ideas related to watershed-based management (ex: TVA), bioregionalism, and protected areas management.[381] Abolishing existing administrative boundaries and management units may be extremely difficult, but case studies suggest that transcending them is possible.[382] "Recognition of the greater ecosystem, much like recognition of a problem, is an important first step."[383]

379*See* Goldstein, *supra* note 81, at 186.
380Slocombe, *supra* note 17, at 293.
381*Id.* at 618.
379*Id.* at 619.
383*Id.*

Effective management of a large, multi-jurisdictional area requires fundamental policy change.[384] If the myriad of institutions and individuals in a region cannot develop detailed, workable coordination procedures, then a new administrative division of an area could eliminate inappropriate and conflicting land use practices.[385]

10. Establish Clear Agency Goals

A common theme among respondents is the need for a clear break with past agency practices and a clear, bold statement of goals for the future. A forest-level Ecosystem Management Coordinator summarized the feelings of many employees:

> We need bold leadership that balances where we are with where we need to go. We need a vision of how to survive the next few years even if we are politically incorrect. People need to be able to speak out because right now our morale is low.

NGOs agreed that the agencies need a clear mission statement that they can strive to reach, in combination with a clean break with past practices. The agency needs a straightforward policy statement that management will synthesize knowledge and applied science to signal that there is a will to change allocations of people and money.[386] In plain language, the trick is to combine sound ecological science with democratic public participation to implement ecosystem management in a manner that will "catch the public's imagination" (and agency employees' imaginations too) as did the early days of conservation inspired by the leadership of Theodore Roosevelt and Gifford Pinchot.

11. Improve Intra-agency Communications Through Leadership

A common observation among respondents was that the message of ecosystem management is not filtering down through the ranks. On-the-ground managers are unsure about the meaning of ecosystem management and the agency's commitment to it. Intra-agency communication must be improved both between upper- and lower-level

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384Goldstein, *supra* note 145, at 297.
385*Id.*
386Boyle and Shannon, *supra* note 20, at 9.

management and among the various regions and forests. Boyle and Shannon (1994) recommend recruiting talented leadership from within the Forest Service at the forest and district levels.[387] Their study offers a number of qualities that leaders must possess, many of which were echoed by respondents here:

• Leaders must "effectively confront cultural and occupational diversity, and the social value debates that accompany these complex internal relationships and public decision-making demands."

• "Willingness to decide with others, tolerance of conflicting ideas, and ability to cultivate knowledge are critical attributes for Forest Service leaders, but decision that are clear and unequivocal are [essential]."

• "Leaders impose reality, by strengthening responsible team approaches to decisions, and drawing a connection between work, timeliness of product, and organization value."[388]

12. Change the Law?

A common immediate response from respondents regarding what to do about legal barriers is "change the law!" Agency managers are frustrated by the myriad of time-consuming legal requirements associated with managing the land. NGOs agree that a successful ecosystem management requires a legislative component that provides the authority to do ecosystem management and gets rid of perverse incentives. One Regional Ecosystem Coordinator hesitated to recommend changing the law because Congress usually does not make things any better: he recommends changing regulations instead. He is right that procedurally it is far easier to revise regulations than to amend laws.

Successful implementation of ecosystem management may require a major overhaul of the complex set of federal, state, and local laws and policies that currently govern natural resources management.[389] For the most part, our country's legal structure has been built upon resolving single issues, managing single resources, or regulating single agency jurisdictions. Essentially, no laws or policies coordinate the many levels of government

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[387] *Id.* at 8.

[388] *Id.* at 8-9.

[389] Norcross, E.J. *Ecosystem Management in a Dynamic Society.* Proceedings of a Conference in West Lafayette, IN: Ecosystem Management in a Dynamic Society, West Lafayette, IN, p. 146, 147 (November 19-21, 1991).

and integrate the many aspects of managing a particular ecosystem.[390] That set-up makes ecosystem planning particularly complex; although, it may also offer localized opportunities to move forward on smaller scales.

13. Improve Monitoring

A common theme among respondents was the need for improved monitoring of agency management actions. Boyle and Shannon suggest that participants stay on the job, in the same place, long enough to enable then to monitor the results of their actions.[391] "Monitoring is the missing ingredient for ensuring resource management accountability, where research becomes synthesized into management to evaluate the effects of choices."[392] Continuity of management in a particular resource area also could potentially increase public trust and credibility as the agency land manager develops a rapport with the local community.

14. Improve and Increase Public Involvement

Better, increased public involvement was the rallying cry among ecosystem management coordinators. Suggestions included: "get people involved up front"; require more negotiation and listening; increase the amount of time spent with the public, work together as teams more often; develop formal public outreach programs; get more people dedicated exclusively to public involvement; make the public feel needed; show them we care; "take success stories and promote them"; and increase communication about values. One District Ranger has been doing more field-oriented meetings with the public, which he found get better responses and elicit more interest. A forest-level Ecosystem Management Coordinator suggested developing exchange programs with the public. For example, switch forest managers with University professors for a semester. NGO executives suggested sponsoring more conferences and devising strategies to bring more people into the fold. One NGO representative thought community outreach was essential; people on the street need to be advised, and kept interested.

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390 *See, i.e., id.*

391 Boyle and Shannon, *supra* note 20, at 8.

392 *Id.* at 10.

15. Interagency Working Groups

A common theme among respondents was that more interagency working groups might help alleviate some of the problems of interagency coordination across administrative boundaries. A BLM planner identified the "Colorado Ecosystem Partnership Group" as a good example. He said that directors of the Forest Service, Park Service, BLM, and USFWS get together to talk about what can be done to promote ecosystem management. The group has evolved to include other professionals. He noted that if the agencies cooperate in sharing resources, it will help blur lines between them. An effective interdisciplinary team process will focus on identifying tradeoffs and other implications of managing ecosystems.[393]

16. Create Structural Support Within Federal Agencies

During the study, I observed that finding out who was responsible for ecosystem management activities was often a difficult task. Employees within the same office often do not know who is working on ecosystem management. Very often responsibilities are splintered among various employees who are unclear what each is doing. Two common themes echoed among respondents were (1) funds committed to ecosystem management are lacking, and (2) a pervasive feeling among agency employees that ecosystem management tasks are extra work, loaded on top of already busy schedules. People and resources need to be specifically earmarked for ecosystem management.

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[393]Super et al., *supra* note 105, at 37.

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