

CHAPTER 7.0 CONCLUSIONS

This research developed a plausible and defensible interpretation of NEPA's intent based on a thorough review and synthesis of NEPA documents and the literature. From this synthesis, a set of NEPA criteria and goals were developed in order to evaluate a sample of Forest Service EISs and their corresponding Forest Plans. Next, ecosystem management was defined based on a review and synthesis of the ecosystem management literature. Ecosystem management evaluation criteria and goals were similarly developed in order to evaluate a sample of Forest Service EISs and Forest Plans. Following additional syntheses and analyses of the NEPA and ecosystem management goals and criteria, evaluation questions were formulated for assessing the cases (plans) in order: (1) to evaluate the extent the Forest Service has implemented ecosystem management; (2) to ascertain whether and to what degree Forest Service implementation of ecosystem management has moved its EIS process closer to NEPA's intent; and (3) to assess the extent ecosystem management implementation has influenced agency planning and decisionmaking processes. Throughout, the literature was used extensively to support conclusions reached on the basis of the case findings.

As stated at the outset, this research does not attempt to make broad generalizations to all forests based on the cases examined. Even so, the cases may suggest a range of variables and key trends important to understanding Forest Service implementation of NEPA and ecosystem management. Below I discuss these variables and trends in four sections, and then conclude with lessons learned and recommendations.

7.1 Case Assessment Outcomes

7.1.1 Extent Forest Service Has Implemented Ecosystem Management

Chapters 4.0 and 5.0 presented the case evaluations of the George Washington and Francis Marion National Forests. Chapter 6.0 offered explicit evidence from the case analyses of the extent the Forest Service has implemented ecosystem management into its EIS and Forest Plan processes. Table 6.1 showed that for the 11 ecosystem management evaluation questions, representing a synthesis of the ecosystem management literature, in each of the cases, 8 responses were indicative of moves toward meeting the "ideal" ecosystem management criteria. Table 6.2 summarized Forest Service case analysis practices that support ecosystem management principles. The cases suggest that the adoption of ecosystem management principles may have been the catalyst for the Forest Service to improve or modify its Forest Plan planning and decisionmaking processes.

7.1.2 Forest Service Implementation of an Ecosystem Management Approach Has Moved Its EIS and Planning Processes Closer to NEPA's Intent

This research has centered on the premise that NEPA is “good” environmental policy as long as the substantive, as well as the procedural mandates of the Act, are jointly institutionalized into federal agency policy, planning, and management. If one accepts the premise that a “better” EIS process is one that more closely adheres to NEPA’s original intent as outlined here—then, yes, the 1993 and 1996 EIS cases are “better” than their respective 1986 and 1985 predecessors. The accompanying 1993 and 1996 Forest Plans are likewise “better” than their earlier counterparts. Key findings from the case analyses (refer to Chapter 6.0, Tables 6.1 and 6.3) provide evidence that the Forest Service’s EIS process has, in fact, moved closer to NEPA’s intent.

As concluded in Chapter 6.0, this improved output is primarily the result of the Forest Service’s incorporation of many of the principles of ecosystem management into its decisionmaking process. It is interesting to note that, ostensibly, NEPA has not figured in the integration of an ecosystem management approach into the Forest Service’s decisionmaking process inasmuch as this research has shown that the goals of NEPA and ecosystem management are essentially the same. As discussed earlier, there was no evidence in the literature or the EIS documents that the Forest Service deliberately set out to improve its NEPA/EIS process by adopting ecosystem management principles. Rather, the agency came to advocate ecosystem management as the outcome of a voluntary decision and an incremental process to improve its overall planning and management directives (refer to Chapter 3.0 and Section 7.4 for a more detailed discussion). Regardless of the rationale for its adoption, one consequence of incorporating ecosystem management has been an improved NEPA process more consistent with the Act’s original intent.

7.1.3 Forest Service Implementation of Ecosystem Management Influenced Agency Planning and Decisionmaking Processes

The most significant indicator that Forest Service implementation of ecosystem management has influenced the George Washington and Francis Marion’s planning and decisionmaking processes is that the Forest Service *has adopted* an ecosystem management approach. In 1992, Forest Service Chief Dale Robertson prepared a memorandum to all Regional Foresters and Station Directors informing them that the agency would be implementing a new management philosophy—ecosystem management. The memorandum was followed by working guidelines for implementing the new philosophy. Again, in 1993 a memorandum from the Forest Chief’s office covering 60 commonly asked ecosystem management questions was addressed to Forest Service Directors, Forest Supervisors, and Forest Managers. Then in 1995, Forest Chief Jack Ward Thomas proposed a rule change that would revise and streamline NFMA to include an ecosystem management approach in agency policymaking, planning and management.

Beyond the explicit evidence from the literature and primary documents, the case analyses also evidenced, although indirectly, that the George Washington and Francis Marion staffs have changed their overall planning and decisionmaking process practices, at least in part, due to the Forest Service's implementation of ecosystem management. Although the case study forest plans fell short of fulfilling some of the key ecosystem management criteria and goals, the criteria and goals incorporated, by inference, must have influenced the way the two forests made planning and management decisions.

Ecosystem management criteria that were met in the cases support the hypothesis that the George Washington and Francis Marion National Forests modified their decisionmaking processes. First, in comparing the earlier cases to the 1993 and 1996 cases, more attention was given by the latter cases to integrating environmental, social, economic, and technical considerations, particularly in the 1993 case. This indicated that Forest Service staff not only placed increased value on each consideration, but that they also understood their interconnectedness. Second, in the latter cases, monitoring and evaluation programs referenced earlier monitoring and evaluation results. This recognition suggested that agency staff were self-conscious of the fact that they were engaged in an adaptive approach to decisionmaking. Third, the 1993 and 1996 cases adopted a more holistic or systems view of lands within forest boundaries than previous efforts had evidenced. The documents discussed the forest as a single unit with many interconnected watersheds, matrices, and corridors rather than a set of individual resource management areas. The importance of maintaining and enhancing all types of ecosystems and the resources within them was an essential component of the decisionmaking process, even if confined within forest boundaries.

One of the principal goals of ecosystem management is to incorporate a broad, integrative, and interdisciplinary approach to decisionmaking processes. From evidence provided in the 1993 and 1996 EIS documents, supported by literature describing agency organizational structure and informal personal interviews with Forest Service staff, the cases did not fully meet this goal. Reasons why these case efforts may have fallen short of the ideal include: the agency's hierarchical structure composed of a management team and disciplinary specialists versus truly interdisciplinary professional structure; limited means of within-forest and between-forest informational exchange (making it difficult for disciplinary specialists to communicate, exchange information and ideas, or collaborate on research projects), and limited educational programs to inform and train staff on ecosystem management principles and interdisciplinary approaches for their implementation. However, within these constraints, the case study forests clearly modified their traditional decisionmaking processes in order to integrate ecosystem management principles into the EIS process to the level that they did. While, determining specific Forest Service modifications to its decisionmaking process were not the direct subject of study here, this represents a fertile area for future inquiry.

7.2 Ecosystem Management in Theory and in Forest Service Practice

A review of the ecosystem management literature, on the one hand, and Forest Service ecosystem management memoranda, workshop proceedings, and the 1995 proposed rule change concerning NFMA, on the other, revealed that there are significant differences of interpretation and emphasis between the two. These differences were reflected in the 1993 and 1996 cases evaluated here. For example, the literature generally promotes the needs of nonhumans over the needs of humans, whereas, the Forest Service's primary directive (in law and also, consistently, in its interpretation of ecosystem management) is to meet the needs of people while sustaining environmental values.

The literature also advocates interactive decisionmaking by consensus among government agencies, affected private organizations, and the public. Meanwhile, the Forest Service seeks public input through questionnaires, letters or open houses (one-way communication), reserving ultimate decision authority for its management team and/or the Regional Forester. Both the 1993 and 1996 EIS public involvement processes followed traditional agency public involvement procedures and the Regional Forester made the final decisions. Additionally, the literature advocates planning within ecosystem scales compatible with natural processes. Forest Service planning, however, is conducted on a temporal and geographic scale that may not be adapted to some larger scale ecological processes. This is so because NFMA currently requires forest plans for each national forest; the boundaries of which are determined by Congressional designation. Legislation, therefore, constrains Forest Service capacity to adopt different planning scales. Consequently, while the 1993 and 1996 EISs acknowledged the need to consider ecosystems at varying time and site scales within and beyond forest boundaries, management decisions were only concerned with traditional forest planning time frames and within forest boundaries. It appears that legislation will need to be amended before the agency could reasonably be expected to realize this ecosystem management aspiration.

These apparent incongruencies raise the question: Is the difference between the ecosystem management literature and the Forest Service's ecosystem management approach (1) the result of conflicting or inadequate information among the leadership of the agency; (2) an illustration of a limited understanding of ecosystem management by Forest Service personnel; (3) due to fundamental differences in philosophical approaches to the concept of ecosystem management; or (4) due to overwhelming implementation constraints that were not sufficiently addressed in the ecosystem management literature? Components of all four scenarios together provide a reasonable explanation for the differences between the literature and Forest Service practice of ecosystem management.

The 1992 Forest Service Working Guidelines for Ecosystem Management state that "Desired conditions . . . must also consider continental and global economic and environmental effects of

choices made at local and regional scales. . .” (USFS 1992:4). The guidelines continue, “Think about the effects of proposed actions at several geographic scales and through time; at least one scale larger and one scale smaller than the scale you are working at and at least for several decades into the future; more and longer if possible” (USFS 1992:4). However, the 1993 Memo on Ecosystem Management Questions and Answers stated that, “Forest Service Plans apply only to management of national forest lands” (USFS 1993b:12). Agency staff at the forest level are, obviously, receiving conflicting information from agency leadership. Neither the 1993 nor the 1996 case study gathered information beyond forest boundaries, except for limited analyses of social and economic issues. The 1993 EIS acknowledged the importance of studying ecosystem patterns and processes at different geographic and time scales, but management decisions were confined to forest boundaries. Similarly, the 1996 case study discussed biodiversity, fragmentation, and ecosystems, but only within the context of forest boundaries.

A second illustration of conflicting or inadequate agency directives occurred in the 1996 Francis Marion EIS process. There, the EIS was based on ecosystem management principles. However, the ROD never acknowledged an “ecosystem management” approach. Indeed, the ROD was entirely of the traditional format and wording. Was this a deliberate decision on the part of the Regional Forester because of a lack of legal precedent to prepare a ROD otherwise? Or, was this inconsistency due to little or no direction from above for preparing a ROD according to ecosystem management principles? Or, were the EIS and Forest Plan documents and the ROD prepared by two different groups of Forest Service personnel? It was not possible to obtain answers to these questions based on information provided in the EIS documents. But, these are interesting issues for future research because they will reveal how and in what format Forest Service policy is disseminated throughout the agency.

There are also differences that may have arisen largely because of limited ecosystem management training and education of Forest Service personnel and other participating members of the public, organizations, and agencies. In fact, the 1993 and 1996 plans explicitly acknowledged that little or no public, organization, or other agency education was part of the EIS planning process. It was not possible, however, to discern through the EIS documents what level of ecosystem management education or training Forest Service staff received. The documents evidence knowledge of ecosystem principles. Therefore, it can be inferred that at least some staff members have received ecosystem management training. Future research could explore the reach and character of Forest Service internal educational programs and their effects on agency decisionmaking processes.

As stated above, the differences between the ecosystem management literature and the Forest Service’s interpretation of ecosystem management can also be viewed as arising from a fundamental difference in philosophical approach. Much of the ecosystem management literature can be viewed as an “idealized” interpretation of ecosystem management principles that have not

been tested on-the-ground. While the Forest Service's interpretation of ecosystem management can be viewed as grounded in practice or practicality as well as Congress' demand that they balance competing resource claimants. The ecosystem management criteria, as developed here from the literature, represent conceptual "ideals."

"Ideals" need not hinder progress because it may not possible to achieve them completely. "Ideals" become problematic only if steps toward their achievement are not seen as just that—progress. With more applied ecosystem management experience, it is likely that current "ideals" will be modified, discarded, or replaced by new "ideals," and that these conceptions, in turn, will guide future innovation and change. Therefore, one should not reproach the Forest Service for having fallen short of some of the "ideal" ecosystem management criteria evaluated in the case analyses. Rather, the agency staff who prepared the George Washington and Francis Marion National Forest EISs and Forest Plans are to be commended for how far they have come in such a short time. This progress is particularly noteworthy since they have attained it with little substantive guidance for implementing ecosystem management from above. The 1995 proposed rule change concerning NFMA, if and when adopted, should fill part of this void.

There is another body of ecosystem management literature, however, that can appropriately be labeled, "applied." The applied ecosystem management literature is prescriptive and often cites case examples and evaluative studies [Everett et al. 1994; Yaffee 1994; McLain and Lee 1996; Ringold et al. 1996; Shindler et al. 1996; Yaffee et al. 1996]. Even some of the idealized ecosystem management literature makes reference to other articles, books, research efforts, etc. that are applied in character (e.g., Grumbine 1994; Maser 1994). Some generalized strategies for ecosystem management implementation based on outcomes assessment of referenced projects—what works on-the-ground—were presented in Chapter 3.0. Presumably, these strategies were based on evaluations of applied methods that either worked or did not work. However, in generalizing their respective evaluation outcomes, the authors condensed them so that they were presented as more "idealized" than "applicable." For example, the Interagency Ecosystem Management Task Force (1995) suggested working with Congress and the Office of Management and Budget to "revise budget structures." This is a valid and worthwhile proposal, but specifically how is a federal agency, particularly within the current political climate, to accomplish this task?

The "idealized" ecosystem management criteria proposed in the literature and as used in this research may be off the mark in some respects because they very often fail to distinguish what is feasible or reasonable. For example, the literature strongly supports development of a shared vision among federal, state and local agencies, industry, organizations, and the public. But it is virtually silent on how this is to be attained. How do affected public agencies procedurally develop this vision, and then guarantee all parties share in it? It is relatively easy for theorists, academics, or appointed task forces to promote the merits of a shared vision. It is another matter

to realize that vision among agencies, industry, etc. because of the complexity of the issues, the ranging view points and interests of the principals involved, and the many institutional constraints from within and outside the individual constituencies engaged.

A second illustration of where the “idealized” literature may be limited is the criterion that requires a decisionmaking framework based on group consensus. Theoretically, consensus leads to improved decision quality and greater commitment to project decisions by the stakeholders. Interested publics often have substantial information and expertise, and stakeholders are more likely to support decisions they had a part in formulating. On the other hand, how does an agency accomplish “consensus” among stakeholders with sharply different views on the equities at stake? In the Forest Service cases examined here, there was no attempt to reach consensus among the competing interests and views. Comments received from reviewing agencies, organizations, and the public generally fell into two categories: those that supported the Forest Service’s traditional management methods and those that supported an ecosystem perspective. Overall, the proponents of traditional forest practices “won” in the 1985 and 1986 cases, while, the proponents of an ecosystem perspective “won” in the latter cases.

There are numerous books and articles that describe public involvement and consensus-building techniques [e.g., Doyle and Straus’s *How to Make Meetings Work* (1976), Fisher and Ury’s *Getting to Yes* (1981)]. Some provide specific examples of how consensus can be reached through negotiated agreement, or similar techniques. For this approach to work, the participants must be willing to accept that there are no “winners” or “losers.” But, even if agreement is reached among participating key stakeholders, there is no guarantee that other members of the stakeholder groups will support that decision (Clark and Minta 1994). To avoid polarization of humans over environmental considerations, Brown and Peterson (1993) propose an intriguing concept—the “citizen jury,” in which citizens are randomly chosen, educated in ecosystem management principles and project-related issues, and then, as a jury, reach planning and management decisions through consensus. Similarly, Sample (1993) suggests using informal advisory groups of key stakeholders outside the EIS process. However, neither concept has been tested on-the-ground (refer to Section 6.3.5).

There is an inherent tension between consensus-building efforts and the chain of democratic accountability that is not recognized in the “idealized” ecosystem management literature. The Forest Service, as mandated steward of the Nation’s forests and grasslands, is ultimately responsible for their management and the agency must, therefore, retain final substantive authority for decisions concerning them. Likewise, the Forest Service has been delegated authority to address a critical set of issues that are of concern to many constituencies who, clearly, do not always agree. Furthermore, the constituency information process, while critical to the decisionmaking process, cannot be expected to replicate in the population the expertise that the agency exists to provide. How can the Forest Service establish with certainty who all the key

stakeholders are and that their voices will be heard in the participatory process? What can the public reasonably be expected to know and what steps can the agency reasonably be expected to undertake to ensure that the public is “informed”? For example, is it reasonable to expect Forest Service personnel to educate all interested citizens in the development and management processes of a Forest Plan that extends to multiple landscape scales and across diverse ecosystems? Where does the agency begin and end such efforts? Within the political, structural, and economic constraints in which the Forest Service must operate, it does not seem feasible that the agency can ever hope to resolve these dilemmas. What does seem clear is that while the Forest Service should be urged to address these concerns, it should not routinely be criticized for failure to “resolve” them. The agency is, by definition, likely to be both vexing and, in principle, irremediable. This fact implies a change in the orientation of analysts, elected officials and stakeholders alike concerning just how much the agency itself can be expected to accomplish via its planning process.

7.3 NEPA Literature vs. Ecosystem Management Literature

What is the impact of having two complementary literatures (NEPA and ecosystem management) evolving separately, and yet pointing to essentially similar courses of action, and without either acknowledging that the other body of literature exists? Do we conclude that the literature has not facilitated the Forest Service in terms of the agency’s ability to draw a connection between the two literatures on which it might otherwise have knowingly relied? Because of the evolutionary nature of the two literatures, we can conjecture that it is only at this point that the similarities in the two bodies of literature can be recognized and thus integrated. Or, it may be, in fact, that this research has uncovered their essential similarity. One might also conjecture that these complementary evolutionary processes have strengthened the individual NEPA and ecosystem management literatures as each arrived independently at like conclusions (refer to Table 6.4). Conversely, one might argue that with cross-fertilization, these otherwise complementary literatures might have developed more quickly and robustly.

Perhaps this similarity has not been perceived previously because each literature has been advanced by different groups that have not generally exchanged information with their complements (there has been virtually no cross-referencing between the two bodies of literature). The NEPA literature has been developed primarily by lawyers and academics in the fields of law, policy, and planning, whereas, the ecosystem management literature has been written largely by conservation biologists, landscape ecologists, resource managers, and environmentalists.

A contributing factor to the overlooked connection between the two literatures is that the Forest Service has not generally sought to educate its staff to the substantive goals of NEPA that support ecosystem management principles. The Forest Service Manual and Guidelines deal principally with Section 102(2)(C)—the procedural aspects of the Act. Also, there are very few

articles in the literature that discuss NEPA's substantive goals as applicable to the Forest Service. In fact, only two such articles were located for this effort—*Observations on the Transformation of the Forest Service: The Effects of the National Environmental Policy Act on U.S. Forest Service Decision Making* by Ackerman (1990) and *NEPA and the Emerging Concept of Ecosystem Management on Public Lands* by Keiter (1990). Both articles were published in legal journals—*Environmental Law* and *Land and Water Law Review*, respectively. It is certainly conceivable that most Forest Service staff have not had access to these articles. On the other hand, there are numerous articles in forestry-related journals discussing ecosystem management from both theoretical and applied perspectives.

Another contributing factor was the outcome of U.S. Supreme Court decisions of the 1980s, in which NEPA was designated “procedural” legislation. However, even before the Supreme Court decisions, federal agencies had emphasized Section 102(2)(C) rather than the substantive sections of NEPA. The Act was viewed as “regulatory,” and all but what was legally required [Section 102(2)(C)] was forgotten or ignored. This was due, in part, to agency-prepared NEPA guidelines and the extensive effort needed to comply with Section 102(2)(C) of the Act. Additionally, the enforcement mechanism of NEPA [Section 102(2)(C)] was the only section to include specific criteria to be addressed by federal agencies in project development and planning. The more substantive mandates of NEPA do not stipulate how they are to be enacted and, consequently, there has been much criticism among federal agencies and in the literature that many of the more substantive goals of NEPA are too vague and broad in scope to be effective policy. Therefore, it is understandable that agencies would choose to concentrate their efforts on the section of the Act that offered specific criteria with which to comply.

Ecosystem management emerged within the Forest Service in a different time and under different conditions than did NEPA. NEPA was mandated from above and generally not supported by forest-level staff. Consequently, it was very narrowly interpreted. Ecosystem management, meanwhile, gradually evolved from within through adoption by the Forest Service rank-and-file over the last decade due to the gradual ascendancy and influence of “change agents” within the agency where recruitment was largely the result of NEPA's enactment. The 1985 and 1986 EIS and Forest Plans reflect the agency's narrow interpretation of NEPA as procedural policy, while the latter cases acknowledged ecosystem management principles, but without seeing ecosystem management as the means to attain NEPA's substantive goals.

As evidenced in the case analyses, the Forest Service did not attain all of the “idealized” ecosystem management goals, and, as discussed in Section 7.2, the agency's implementation and/or interpretation of ecosystem management differs in some respects from the ideal as it has been conceptualized in the literature. A summary of the limitations of the Forest Service ecosystem management approach as implemented follows:

- There was limited incorporation of different geologic or long-term time scales in the 1993 and 1996 EISs.
- Both the 1993 and 1996 EISs continued to delineate forest boundaries along politically determined boundaries.
- There was no evidence in either the 1993 or 1996 EIS supporting a broad, integrative, interdisciplinary approach to the planning process.
- There was no evidence of two-way or interactive consensus building among stakeholders in either the 1993 or 1996 EIS process.
- There was no or minimal evidence of public educational programs in the 1993 and 1996 EISs or Forest Plans.

An ecosystem management approach potentially provides the means for the Forest Service to get beyond Section 102(2)(C)—to broaden implementation of NEPA’s substantive goals.

Ecosystem management provides the tools (e.g., adaptive management, GIS and remote sensing technologies, hierarchy theory, ecosystem based data) necessary to realize more fully NEPA’s aims. NEPA provides the broad, integrative goals and mandates, while, ecosystem management provides the specific and detailed guidance for fulfilling the statute’s intent. The outcome of approximating NEPA’s intent will be the further enjoyment, preservation, and enhancement of the environment and natural resources for future generations. However, it is important to recognize that certain tensions implicit with resource management will always remain—e.g., a balance of present vs. future resource needs, conservation vs. preservation of resources, resource use vs. preservation, aesthetics vs. resource use. And it is these tensions that the Forest Service will be asked to address in its planning processes. Those decisionmaking efforts can, therefore, be expected to be and to remain conflictual, values centered, and explicitly concerned with balancing competing stakeholder aspirations. Analysts, elected officials, and stakeholder representatives would do well perhaps to recognize this fact and to approach the agency’s forest plan development process accordingly.

7.4 Agency Discretion—Ecosystem Management As a Voluntary Action vs. Congressional Mandate

Ecosystem management adoption within land and resource management agencies has not been mandated by Congress, the courts, or the Executive Office. Its use has been voluntary. This is contrary to one general conception of how public bureaucratic institutions function. In the case of the Forest Service, former Forest Chief Dale Robertson adopted “New Perspectives” in 1990,

while former Forest Chief Jack Ward Thomas promoted ecosystem management in 1992 and, in 1995, prepared a proposed rule change to give ecosystem management legal and substantive support. The Clinton Administration has actively supported an ecosystem management perspective—Vice President Al Gore appointed the Interagency Ecosystem Management Task Force in 1993, and in 1995, that group issued a memorandum aimed at fostering an ecosystem approach that was signed by the CEQ and 12 additional federal agencies, including the Department of Agriculture. However, this administrative support was largely in response to already existing land management agency initiatives to adopt ecosystem management principles.

Unfortunately, influence and support from the top is subject to change with Presidential or Congressional elections. Following the 1994 Congressional elections, Congress substantially decreased Forest Service appropriations (11 percent from 1994 to 1995), and overall staff has been cut by 14 percent (from 1992 to 1995) (a 25 percent reduction in the Washington, DC office for the same time period), a hiring freeze is in effect, and research budgets have been reduced (USFS 1996c). How can the Forest Service effectively practice ecosystem management without the necessary fiscal and human resources to do so? In addition, Forest Service chiefs change at the discretion of the Administration. Forest Chief Jack Ward Thomas retired in October of 1996 and Mike Dombeck took his place on January 6, 1997. It is too early to tell if Forest Chief Dombeck will continue to advance an ecosystem management approach in agency policy formulation and decisionmaking. But, in any case, it is clear that should he continue the initiative, he will do so with fewer resources—despite the costs implicit in full-scale realization of such efforts.

Even though actual implementation of ecosystem management in the Forest Service has been voluntary, changes brought on by “outside” forces such as NEPA and NFMA have served as catalysts for more abrupt and dramatic changes within the agency. NEPA’s passage compelled the Forest Service to reevaluate its planning framework to include consideration of the environmental consequences of its proposed actions. In response, the agency hired specialists of varied professional backgrounds, e.g., economists, planners, wildlife biologists, landscape architects. These specialists, in turn, brought new values and more diverse perspectives to the planning and management of the National Forests. The resulting multidisciplinary staff has allowed the agency to move beyond traditional agency approaches to forest management, to approaches such as “New Perspectives” and ecosystem management. Many of these early “change agents” have gradually ascended to management positions (“top down”) and have contributed to the agency’s adoption and acceptance of “New Perspectives” and ecosystem management. Also, recent Forest Service recruits are more likely to have taken courses in systems ecology and/or ecosystem management during their college educations. Thus, further impetus to adapt an ecosystem management approach has come from the lower ranks of the Forest Service (“bottom up”). It was also agency staff members who developed an environmental ethics policy based substantially on ecosystem management principles (i.e.,

Association of Forest Service Employees for Environmental Ethics). The outcome of this “grassroots” effort is now Forest Service policy.

A third set of changes brought about by NEPA and NFMA has been the impact of public involvement on forest planning and management efforts. After the initial changes brought about by NEPA’s passage and the gradual rise in the influence of “change agents” within the agency, the adoption of ecosystem management might have taken longer to achieve, if it were not for public opinion, outside agency review, and stakeholder appeals and suits. The first forest plans were made available for public and agency review in the early 1980s. Many of the decisions revealed in these plans received significant negative criticism from the public and reviewing agencies, and prompted the filing of numerous appeals and suits (the 1986 George Washington National Forest case resulted in 18 appeals filed and the withdrawal of the Forest Plan). Forest personnel at all levels were not pleased with those results. Consequently, agency staff who had previously disdained an ecosystems perspective were now motivated to look for alternative management approaches and to find ways to improve public involvement practices. Ecosystem management became a viable alternative.

Sustained commitments from the Executive Office, Congress, Forest Service Chief, the rank-and-file within the Forest Service, the scientific community, the various stakeholder publics, as well as the general citizenry, are critical for effective implementation of an ecosystem management approach at the regional and global levels. This may require a national policy promoting ecosystem management (i.e., NEPA), interdisciplinary decisionmaking among all stakeholders, interagency funding, and cooperative scientific data gathering and dissemination. On the other hand, ecosystem management within the Forest Service, at the regional or local level, can quietly proceed, although with reduced effectiveness, without active support from the Executive Office or Congress (assuming that neither is brought into the process by an aggrieved constituent). But, ecosystem management at any level cannot survive without sustained commitment from the agency’s rank-and-file, the scientific community, and the public.

Ecosystem management is not merely a prescriptive planning, management, and decisionmaking process. It is a philosophical approach or worldview that has been gradually accepted by Forest Service and other land and resource management agencies, many environmental organizations (e.g., The Nature Conservancy), the scientific community, and many individuals of the general public. The recent literature has been replete with articles discussing ecosystem management, sustainability, and bioconservation (see Chapter 3.0). Most major colleges and universities now teach courses covering these topics and many have established environmental studies and/or environmental science programs to address these topics in greater detail. Notwithstanding, other stakeholders, such as miners, loggers, developers, cattle or sheep ranchers, have been reluctant to adopt, or have been unequivocally opposed to ecosystem management concepts, let alone, an ecosystem derived philosophical perspective. But, a recent study of non-industrial private forest

owners by Brunson et al. (1996) found that once this group understood ecosystem management principles, its members were generally agreeable to implementing many of them with one caveat—the federal government was not to be involved in the process. This presents a paradox, as federal agencies have been the leaders in this effort.

7.5 Lessons Learned and Recommendations

7.5.1 Lessons Learned

This section describes important lessons learned from this research. It is clear that Forest Service decisionmaking is a political process that involves balancing competing agency, private industry and public interests. It is also clear that “change agents” come from diverse sources—from within the agency’s institutional structure (top-down and bottom-up); from within the federal governmental framework (e.g., other agency policies, Congressional committee decisions, budgetary constraints, trade agreements); from outside the federal government (state and local governmental agencies, private industry, public opinion, private nonprofit and for-profit organizations); and from an uncertain and dynamic political and economic environment. Therefore, forest planning and its associated NEPA analyses must be considered a part of a never-ending and evolving process. Consequently, the Forest Service must take an adaptive approach in its decisionmaking process, and ecosystem management has the potential to allow the agency to do so in a way that ensures that:

- Ecosystem diversity, health and productivity are maintained and/or restored.
- An interdisciplinary approach is adopted that includes all possible relevant constituencies in the planning and decisionmaking process.
- Policy, planning and management decisions are adaptive and take into account ever-changing environmental, social, political and economic considerations in a reasoned and prudent way.
- Human use and occupancy are accommodated while maintaining ecosystem integrity.

Attempts to achieve ecosystem management goals within traditional planning and management models, i.e., hierarchical organizational structures, targeted budgeting, output-oriented award system, agency ownership of data, are not likely to succeed. However, change at the scale demanded by an ecosystem management approach cannot be expected to occur overnight in a complex, bureaucratic culture such as the Forest Service. But, a clear strategy or framework for organizational change and movement in that direction can sustain public and staff faith in the

Forest Service organization as it attempts to respond to the diverse, complex, and interrelated environmental, social, economic and political structures acknowledged by an ecosystem management approach. The 1995 proposed rule provides such a framework.

How much of the Forest Service's movement closer to NEPA's intent can be attributed to the adoption of ecosystem management cannot be quantitatively measured or established.

Movement closer to NEPA's intent can also be explained, in part, as a product of the agency's learning curve in the EIS process, the role of agency staff as "change agents," and the influence of stakeholder publics, and other agency criticisms, appeals and law suits. On the other hand, not until ecosystem management was formally institutionalized into Forest Service policy did EISs and Forest Plans—as documented through the case analyses presented above—show evidence of movement closer to NEPA's intent. Ecosystem management provides the Forest Service with a clear, goal-oriented framework, inclusive of internal and external "change agents" that allow ecosystem management principles to be brought to life.

7.5.2 Recommendations

This section proposes several recommendations for the Forest Service to improve or modify its NEPA and overall planning processes. First, Chapter 6.0 raised several problems with Forest Service reliance on its FORPLAN model for developing alternatives primarily because of its inability to evaluate qualitative issues. It will take more than a refinement of the agency's current model to evaluate comparatively and equitably quantitative and qualitative issues. The Forest Service should establish a baseline framework against which all reasonable alternatives could be evaluated. This framework would be grounded on the long-term goals of Forest Service policy and ecosystem management principles and resemble the sustained ecosystem model suggested by Kennedy and Quigley (1994) (see Section 3.2.3). The model would be used to generate a range of reasonable alternatives that meet the criteria established for the baseline framework. That is, all considered alternatives would be "sustainable" or "environmental" alternatives, as defined by NFMA, Forest Service ecosystem management policy and NEPA, respectively.

Additionally, the Forest Service, in its public involvement process, should operate from a goals and objectives perspective rather than an issues orientation as it did in the cases (refer to Section 6.4.2). This perspective addresses many of the problems raised by the issues orientation approach. Goals and objectives are larger and more holistic than the individual issues typically raised during scoping. When participants agree on fundamental goals and objectives, but disagree on how they are to be attained, there are various options for resolving differences. Ecosystem management, NEPA, and now Forest Service policy have the same overall goal—sustainable management of ecosystems over the long term. Participatory decisionmaking should focus on the means to achieve this common goal through the development of supporting subgoals and objectives. Alternatives would only be considered that met the criteria established for the

subgoals and objectives. No subgoal or objective would be omitted from consideration in a sustained ecosystem model, or any other decisionmaking framework, as is typically the case using the FORPLAN model.

A third recommendation would be for the Forest Service to incorporate the interdisciplinary planning model it is currently employing at its top level. As discussed in Sections 6.3.3 and 7.13, top agency staff now regularly participate in interdisciplinary workshops and task forces, and have formed interagency agreements. The agency should incorporate this same interdisciplinary planning model at the forest and regional levels. As described earlier, current forest level planning policy and management decisions are based on the individual contributions of varied disciplinary specialists within the agency and then a separate management team or the Regional Forester makes planning and management decisions. Using the “tested” model—that seemingly has the approval of upper agency management—would allow the Forest Service to meet NEPA’s intent more effectively by using a systematic, interdisciplinary approach for ensuring the “integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking . . .” [Section 102(2)(A)].

Finally, the level of public involvement in forest plan decisions must be increased. It is evident that the Forest Service is a long way from instituting decisionmaking by consensus as proposed by the ecosystem management literature due to legal mandates, tensions created in the democratic process, etc. (see Section 6.3.5 for further discussion). Nevertheless, there are examples within individual forests, where citizen advisory groups have been formed for receiving input and to discuss issues in detail. This format should be expanded to include representatives of all key stakeholder groups [as defined by Sample (1993)], who would then participate in two-way interactive dialogue with Forest Service representatives. Before initiating the participatory or advisory process, the members must be educated with regard to ecosystem management principles and the NEPA process. The desired outcome would be the institutionalization of this participatory process throughout the agency for all levels of policy formulation, planning, and management. In this model, the agency would continue to make final decisions. But, it is hoped that those decisions would reflect the input of the stakeholders, while maintaining or enhancing ecosystem patterns and processes.

What the U.S. discovered in the 1960s—that people must deal with the environment as a comprehensive, integrated whole—the nation is rediscovering in the 1990s and—at last—beginning to practice.

—CEQ 1990:219