

CHAPTER 1.0 INTRODUCTION

1.1 The Forest Service, NEPA, and Ecosystem Management

The U.S. Forest Service has incorporated ecosystem management principles into its planning and environmental impact statement (EIS) procedures in conjunction with revisions to its Land and Resource Management Plans (Forest Plans). This research is designed to explore the extent to which the agency has implemented these principles in specific selected cases, to evaluate the effects of Forest Service adaptation of ecosystem management on the agency's implementation of the National Environmental Policy Act (NEPA), and, finally to assess whether and to what degree implementation of this new management approach has allowed the agency to come closer to meeting NEPA's intent than did prior planning frameworks.

Twenty-one years have passed since the National Forest Management Act (NFMA) of 1976 was enacted with its requirement that the Forest Service prepare forest plans for each unit of the National Forest System. Regulations for forest plan development were adopted by the Forest Service in 1982 and amended in 1983. Forest Service policy concerning Forest planning and management has continued to evolve over time from "sustained yield," to "multiple use," to "New Perspectives," and now to "ecosystem management." These shifts in policy have been undertaken at the agency's own volition, and not in response to the direct mandate of the NEPA, or other legislation.

The evolution of the Forest Service toward adoption of a planning process that incorporates ecosystem management principles has been facilitated by parallel evolutionary processes that have occurred within ethics, the sciences, policy and decisionmaking, and technology. The ecosystem management framework represents a fundamental change from a fragmented, incremental planning and management approach to a more holistic, comprehensive, and interdisciplinary land and resource management effort. The goals of ecosystem management include:

- Manage with regard to ecosystem constraints and ecological principles.
- Maintain and restore ecosystem diversity, health and productivity.
- Develop and adopt an interdisciplinary approach to policy formulation, planning and management.
- Incorporate adaptive management procedures.
- Accommodate human use and occupancy while maintaining ecosystem integrity.

Like ecosystem management later, NEPA sought "to reorient federal agencies toward a consciousness of and sensitivity to the environment" (Senator Edward Muskie 1969, as cited in Bausch 1991). The three-fold purpose of NEPA was to:

- Declare a national policy which will encourage productive and enjoyable harmony between man and his environment.
- Promote effects which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man.
- Enrich the understanding of the ecological systems and natural resources important to the Nation (Section 2).

To accomplish these lofty goals, NEPA required a “systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man’s environment” [Section 102(2)]. NEPA intended for agency decisionmakers to balance competing equities [Section 102(2)(B)] in as thoughtful and open planning process as possible [102(2)(C)(v)].

Over the last 25 years, there has been much praise and criticism in the literature of NEPA and its mandated EIS process. Three key themes have arisen from the NEPA criticisms:

1. A lack of engagement with the NEPA process early in the planning process through interdisciplinary collaboration.
2. A lack of rigorous science and the incorporation of ecological principles or techniques as an appropriate mechanism for enriching our understanding of ecological systems and natural resources.
3. NEPA has fallen short of its intent because its substantive goals and objectives have largely been ignored, e.g., “attain the widest range of beneficial uses of the environment without degradation . . . ,” “achieve a balance between population and resource use . . . ,” and “enhance the quality of renewable resources . . .” [Section 101(b)(3), (5), (6)].

1.1.1 Research Questions

Even a cursory review of the preceding section suggests that ecosystem management, as a resource planning process, has goals that are strikingly similar to NEPA’s intent. Moreover, the goals of ecosystem management appear to address the key criticisms of NEPA implementation efforts that have been offered in the NEPA literature over the last 25 years. These striking parallels raise a question central to this research:

If ecosystem management principles are integrated into agency planning and decisionmaking, (1) will agency decisionmaking move closer to NEPA's intent, and, (2) thereby, allay much of the criticism of NEPA discussed in the literature?

To be able to address this larger question, a set of sub-questions must be addressed:

1. What is NEPA's intent? Can the "intent" of the statute be expressed in terms of goals and objectives?
2. Has NEPA's intent changed over the last 27 years? If so, in what way(s)?
3. What is the conceptual basis for an ecosystem management approach? What are its goals and objectives?
4. Are the goals of NEPA and ecosystem management comparable? If so, can the use of an ecosystem management approach in NEPA/EIS planning and decisionmaking enhance Forest Service prospects for meeting NEPA's intent?
5. How does the Forest Service's interpretation of ecosystem management compare to the goals and objectives for that approach outlined in the relevant academic literature?
6. How does a select sample of Forest Service EISs and Forest Plans prepared prior to the incorporation of ecosystem management compare to a sample of EISs and Forest Plans prepared after the incorporation of ecosystem management?
 - a. To what extent do the sample plans incorporate ecosystem management principles?
 - b. To what extent do the sample plans meet NEPA's intent?
7. What are the implications of Forest Service ecosystem management practices for our understanding of the current utility and future development of the relevant academic literature?
8. If the incorporation of ecosystem management does indeed move the EIS and Forest Plan process closer to NEPA's intent, what are the implications of that fact for our understanding of the factors critical to both effective policy implementation and to its reasoned and reasonable evaluation?

1.1.2 Research Hypotheses

A review of the NEPA and ecosystem management literature in light of the above questions, generated the following hypotheses:

- Current Forest Service EISs and Forest Plans reflect ecosystem management principles to a greater extent than did Forest Service EISs and Forest Plans prepared prior to 1992.
- Forest Service implementation of ecosystem management has moved agency EIS processes and decisionmaking closer to NEPA's intent.

1.2 Research Objectives

The primary objectives of this research are fivefold:

1. To develop a plausible and defensible interpretation of NEPA's intent.

- To synthesize NEPA's intent through a review of the statute; Executive Orders; CEQ guidance documents, regulations, memoranda, and annual reports to the President; court decisions; as well as the relevant literature.
- To develop a set of criteria, based on the above synthesis of NEPA's intent, for evaluating how well Forest Service EISs and Forest Plans addressed the Act's aims.

2. To develop a reasonable definition of ecosystem management goals from among those conceptions offered in the literature.

- To synthesize the principal findings of the ecosystem management literature in order to develop a reasonable definition of ecosystem management and ecosystem management goals.
- To develop a set of ecosystem management-derived criteria, based on the above definition and goals, for analyzing Forest Service EISs and Forest Plans.

3. To evaluate the extent to which the Forest Service has implemented ecosystem management through an analysis of a set of sample cases in order to determine whether and in what ways adoption of the innovation has influenced the agency's resource management decisionmaking process.

- To evaluate a sample of pre-ecosystem management Forest Service EISs and Forest Plans in depth against literature-derived evaluative criteria to determine how closely these efforts approximate ecosystem management goals.

- To evaluate a sample of post-ecosystem management Forest Service EISs and Forest Plans against the set of ecosystem management criteria to determine whether and to what extent Forest Service planning and decisionmaking processes have moved closer to meeting ecosystem management goals.
- 4. To ascertain whether and to what degree Forest Service implementation of ecosystem management in its EIS and Forest Plan planning practices has moved agency EIS processes and decisionmaking closer to NEPA's intent.**
- To evaluate pre-ecosystem management Forest Service EISs and Forest Plans against NEPA evaluation criteria to determine whether and to what extent the EISs and Forest Plans approximate NEPA's intent.
 - To evaluate post-ecosystem management Forest Service EISs and Forest Plans against NEPA-derived evaluation criteria to determine whether and to what degree the Forest Service's decisionmaking process approximates NEPA's intent.
- 5. To propose recommendations for the Forest Service based on lessons learned from the case analyses and to explore the broader implications of ecosystem management implementation for our understanding of environmental policy, planning, and practice.**
- To identify and analyze the strengths, deficiencies, and limitations of current Forest Service EIS and Forest Plan planning processes based on in-depth case analyses and the literature.
 - To recommend changes within the Forest Service's planning and decisionmaking processes as these relate to EIS and Forest Plan development and to ecosystem management concept application in order to bring agency planning practices into even closer accord with NEPA's intent.
 - To explore the implications of Forest Service ecosystem management practices for current utility as well as future development of the relevant literature.
 - To understand the factors critical to both effective policy implementation and to its reasoned and reasonable evaluation.

1.3 Research Methodology

Andrews (1985:122) has postulated that two broad and fundamental criteria ought to be used to evaluate agency responses to NEPA: “the extent to which an agency has incorporated the law’s requirements and the extent to which such incorporation has led to outcomes consistent with NEPA’s policy goals.” For the most part, this research adopts Andrews’ approach. Case analyses of Forest Service EISs and their accompanying Forest Plans are used to ascertain the extent to which the agency has sought to address NEPA’s requirements and to determine the extent of that integration. In addition, the case analyses are employed to determine if ecosystem management has led to planning process outcomes more consistent with NEPA’s intent than previously. On-the-ground outcomes assessment, however, was not an aim of this study. That is, this research, through an analytical case study approach, develops a framework for assessing how the Forest Service integrated ecosystem management into its forest plans and how that integration has affected its NEPA and planning processes. No attempt, however, was made to ascertain whether or not the resulting changes in the agency’s NEPA and planning processes were carried out in day-to-day management activities within the forests studied.

1.3.1 Why Evaluate U.S. Forest Service EISs and Forest Plans?

Forest Service EIS efforts were selected for case analyses for several reasons:

- The agency has taken a leadership role among federal agencies in adopting an ecosystem management approach.
- NFMA mandated development of a definitive planning process to manage all lands within the National Forest System, including the preparation of Forest Plans for each forest unit.
- The NFMA planning process was linked to the agency’s NEPA process; consequently, EISs are prepared concurrently with the development of Forest Plans.

1.3.2 Why an Analytical Case Study Approach?

An analytical case study approach was determined to be the most effective method to address the research questions and to test the hypotheses offered in this research. The agency planning process as well as the outcomes were of interest—i.e., how the Forest Service integrated ecosystem management into its planning process as well as the effects of adopting an ecosystem management approach in shaping how the agency would approach actual resource management choices. Case analyses were also appropriate because they allowed for a systematic and detailed way to assess how elements were actually addressed in the individual forest plans examined, and thus, how they occurred in actual practice vs. the literature’s expectations.

Case analyses of Forest Service EISs and their accompanying Forest Plans proved the most effective way to assess the extent to which the agency has implemented ecosystem management principles, to evaluate the effects of this adoption on NEPA, and to assess whether implementation of this new management approach more closely approaches NEPA's intent. Although the form of case analysis employed here did not allow direct access to internal agency decision dynamics (e.g., how alternatives were formulated and by whom, acceptance of ecosystem management by agency staff), the EIS and Forest Plan documents are tangible evidence that represent the Forest Service's overall management philosophy or planning approach to land and resource management at specific points in time. And these plans guide actual resource allocation on the Forest after their adoption. Therefore, to ascertain whether ecosystem management has influenced a range of considerations is to analyze how the agency developed or defined its critical resource allocation choices.

Evaluating "extent" and "effects" presupposes comparative analysis. Therefore, forests were selected in which pre- and post-ecosystem management EISs and Forest Plans were completed on the same forest. After a review of EIS abstracts and conferring with numerous Forest Service staff, only two sets of pre- and post-ecosystem management EISs and Forest Plans were found to be available that could afford such comparisons. Because many forests did not finalize their first EIS and Forest Plan processes until the mid-1980s, many are just now beginning to revise their plans (Forest Plans are generally revised every 10 to 15 years). The two Forest Service EIS and Forest Plan iterations used for the case analyses are:

- The 1986 George Washington National Forest Final EIS and Forest Plan (pre-ecosystem management) and the 1993 George Washington National Forest Final EIS and Revised Forest Plan (post-ecosystem management).
- The 1985 Francis Marion National Forest Final EIS and Forest Plan (pre-ecosystem management) and the 1996 Francis Marion National Forest Final EIS and Revised Forest Plan (post-ecosystem management).

1.3.3 Generalizability of the Forest Service Case Studies

This research does not attempt to make broad generalizations to all forests within the Forest System as only 2 of 156 National Forests and Grasslands (USFS 1997a) were selected for study. Obviously, forest ecosystems vary tremendously throughout the country, and specific resource management techniques, recreational opportunities, etc., likewise, differ from forest to forest. Furthermore, even though the Forest Service has a strong hierarchical structure, forest units and regional offices have much flexibility in their day-to-day planning and management operations.

Nevertheless, relatively rigid agency planning regulations and guidelines for the preparation of Forest Plans and NEPA documents come from Washington, rather than regional or forest level offices. As a result, there has been much consistency from forest to forest with regard to the Forest Plan and EIS processes. Additionally, NEPA regulations have not been revised since 1978. Changes noted within the Forest Service EIS process over the last 10 years can, therefore, be attributed primarily to changes in agency policy. Ecosystem management policy statements and directives have also come from the top. However, it cannot be assumed that all forests have responded in similar ways in adopting an ecosystem management approach as ecosystem management has evolved at the “grassroots” level among various local and regional Forest staffs as well. Future research may focus on clarifying the roles of forest units, regional offices and Washington in realizing the goals of ecosystem management. This study provides a foundation for such work by providing a framework for evaluating the extent to which the Forest Service has implemented ecosystem management as evidenced through an analysis of EIS and Forest Plan documents.

Representativeness along size, landscape diversity, and management methodologies was less relevant to this study than exploring to what extent the Forest Service forest planning process meets NEPA’s intent and to what degree ecosystem management principles have been incorporated into it. In undertaking the latter, this study sought to develop a structure for conducting case analyses of National Forests by delineating “ideal” NEPA and ecosystem management criteria from the academic literature and primary documents and by clarifying aims and outcomes. Future research may replicate this effort in different regions, and in addition, seek to determine whether variations in approach can be discerned among individual Forests by region, ecosystem type, level of grassroots involvement, or related variables.

1.3.4 Development of Evaluation Criteria and Questions

My primary research tools were the literature and primary documents. These tools were used to develop “ideal” NEPA and ecosystem management criteria for the analytical case studies. As presented in the literature, these “ideal” criteria should have been employed and reached in the Forest Service’s planning and management processes. Development of the evaluation criteria was a multi-step process.

To develop a plausible and defensible interpretation of NEPA’s intent and how its interpretation has changed over the years, in-depth reviews were conducted of the statute; Executive Orders; CEQ memoranda, guidelines, regulations and annual reports; court decisions; as well as an extensive review of the NEPA literature. To develop a reasonable definition of ecosystem management goals, the ecosystem management academic literature and Forest Service ecosystem management policy statements, guidelines, memoranda, and the 1995 proposed rule change were reviewed in depth. From the document and literature reviews, evaluation criteria were developed

on the basis of a heuristic process following empirical lines vs. a pre-established index or measure. Appendices A and B provide complete lists of the NEPA and ecosystem management evaluation criteria. Criteria were synthesized and grouped into major categories, from which NEPA and ecosystem management goals were derived.

In order to undertake the case analyses, evaluation questions were developed that could be “answered” through examination of the EIS and Forest Plan documents. The questions were formulated from the lists of NEPA and ecosystem management criteria and were designed to reflect each of the goals. However, most of the questions were inclusive of more than one goal. Matrices in Chapters 2.0 (NEPA) and 3.0 (Ecosystem Management) list the evaluation criteria and how the questions relate to each.

Question development was an iterative process. Questions were compared to NEPA and ecosystem management goals and evaluation criteria; questions were rephrased or new questions were asked; revised questions were compared afresh against the goals and evaluation criteria. The NEPA and ecosystem management questions were again tested and revised when the case analyses were initiated. Case analyses began with more questions, and in some instances different questions, from the final list of questions actually used in the analyses. Some questions could not be addressed through the EIS and Forest Plan documents, while other questions needed to be rephrased to be answerable. Again, this was an iterative process in which questions were checked, revised, and rechecked against the EIS and Forest Plan documents. Most questions could not be answered with a simple “yes” or “no.” Therefore, a heuristic scale was developed similar to the one developed by Kennedy (1992). The resulting answers to each question correspond to “meets the criterion,” “somewhat satisfies the criterion,” and “does not meet criterion.”

This procedure allowed comparative evaluation of Forest Service EIS processes and decisionmaking along three lines:

1. Extent to which the Forest Service has implemented ecosystem management.
2. Degree Forest Service implementation of ecosystem management has moved agency EIS processes and decisionmaking closer to NEPA’s intent.
3. Implications of Forest Service ecosystem management practices for current utility as well as future development of the relevant literature.

1.4 Relationship to the Literature

The literature is replete with assessments of single EIS projects or single issues of concern to the EIS process, e.g., scoping, scientific quality, mitigation. But, there have been only a limited number of comparative case studies of the NEPA/EIS process. Previous comparative EIS evaluations have been conducted by Caldwell (1982b), Sewell and Korrick (1984), Kent and Pendergrass (1986), Culhane et al. (1987), Ginger and Mohai (1993), and Leon (1993). None of these studies assessed EIS documents prepared later than 1990. Consequently, there are no published studies that have evaluated the NEPA/EIS process since federal agencies have integrated ecosystem management into their decisionmaking processes.

Project application of ecosystem management is relatively new. Consequently, there are relatively few case assessments in the literature. The Interagency Ecosystem Management Task Force (1995, 1996) evaluated large-scale, integrated management practices within seven ecosystems that were each developed by a consortium of federal, state and local agencies, and public and private interests. In a recently published book and article, Yaffee et al. (1996) and Yaffee (1996) assessed 77 ecosystem management-based projects at all scales that included several projects in which the Forest Service participated. However, neither study included an evaluation of the links between ecosystem management and the NEPA/EIS process. Therefore, this research is the first of its kind.

1.5 Organization of the Study

Chapter 2.0 offers the rationale employed in synthesizing NEPA's intent in order to develop the criteria used to formulate the questions for the case studies. Chapter 3.0 likewise provides the rationale employed in defining ecosystem management and developing the criteria used to formulate the questions for the cases examined. Chapters 4.0 and 5.0 present the results of the case analyses. Evaluations of the study results are provided in Chapter 6.0, along with a discussion of findings based on them. Chapter 7.0 presents conclusions and implications for policy implementation, and discusses lessons learned from the literature and case studies.