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**The "Social Acceptability" Component
of Ecosystem Management:
Synthesis and Problem Analysis**

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The USDA Forest Service in 1992 announced a major shift in agency policy with its adoption of *ecosystem management*, defined by then-Chief Dale Robertson as "a multiple-use philosophy built around ecological principles, sustainability, and a strong land stewardship ethic, with a better recognition of the spiritual values and natural beauty of the forests" (Robertson 1991, p. 19). Implicit in that definition is the idea that national forest management must be more responsive to a changing social environment as well as to growing knowledge about forests and ecosystems. Or, as another high-level Forest Service staff member put it, the nation needed "a scientifically sound and socially acceptable forestry of the future" (Salwasser 1990).

Accordingly social scientists funded through the agency's Pacific Northwest Research Station began examining what "socially acceptable" forestry means. One component of that effort was a project to examine how innovative forestry practices associated with ecosystem management might affect the diverse set of values people attach to forests. This research (Brunson 1992) focused on questions of defining social acceptability, predicting potential social impacts of ecosystem management practices and conditions, and describing how new technologies can be used to assist in evaluating short- and long-term social impacts of novel forestry practices and conditions. As part of the research, a workshop was held in Kelso, Wash., in June 1992 during which scientists in several social science disciplines considered implications of socially acceptable forestry. In December 1992, a cooperative agreement was signed between Pacific Northwest Research Station and Utah State University, the purpose of which was to make the products of that workshop available to a wider audience.

This document is the final report for that second agreement. Specific objectives of the new project were to:

1. Make available to forest managers and researchers a multi-disciplinary synthesis of issues pertaining to the social acceptability of ecosystem management; and
2. Chart a direction for future research on social acceptability as a resource management criterion.

The primary task associated with meeting those objectives was to assemble for publication a series of papers discussing the implications of social acceptability as a component of ecosystem management, as seen from several different academic perspectives. This task encompassed editing of papers, obtaining and tracking peer reviews of submitted papers, and ensuring that resulting publication meets guidelines for Pacific Northwest Research Station general technical reports. This work is ongoing. Papers have been submitted and peer-reviewed, and revised articles are now (as of Fall 1993) being received and edited to meet Forest Service style guidelines.

A secondary task for the principal investigator was to prepare for inclusion in the above-mentioned publication a problem analysis which recommends directions for future research on the social acceptability of ecosystem management, based on the investigators previous research on this issue as well as the discussion in other papers submitted for the publication. As this work progressed, it became clear that two articles were, in fact, needed. One was a paper that defines "social acceptability" in a scientifically defensible way; the other a problem analysis. Those two papers are included in this report, along with a list of other articles that were submitted for inclusion in the publication.

The first of the papers, "A Definition of 'Social Acceptability' in Ecosystem Management," is a response to the observation by Stankey and Clark (1991) that "there is an inadequate understanding of what constitutes 'acceptability' with regard to [ecosystem management]." Based on research undertaken in response to that analysis, the paper offers a working definition of social acceptability. Subsequent discussion focuses on the implications for ecosystem managers of four aspects of that definition: the social context of individual judgment; influences upon the comparative process; behavioral expressions of acceptability judgments; and observation/measurement issues.

The second paper, "The Social Context of Ecosystem Management: Unanswered Questions and Unresolved Issues," considers emerging problems associated with ecosystem management as an idea, about its implementability, and about specific aspects of ecosystem management practices and conditions. The discussion covers issues raised by national forest stakeholders as well as those arising from the Kelso workshop. The most basic question concerns the acceptability of the ecosystem management concept itself -- a question that largely has been ignored by those who seek to adopt ecosystem management. Reasons are discussed for this omission, as well as potential answers to the question. A key element of that discussion, and a theme that reverberates through this problem analysis, is the issue of scientific uncertainty and risk -- the overriding public and professional concern identified during this research.

The other papers that have been submitted for the publication are listed on the following page. The final document will also include an introductory chapter written by Mark Brunson and George Stankey.

The communicative roots of social acceptability: The case of policy arguments in forest and natural resource management. Bernard Lewis, Dept. of Forest Resources, University of Minnesota, St. Paul.

Defining the social acceptability of forest management practices and conditions: Integrating science and social choice. George Stankey, Dept. of Forest Resources, Oregon State University, Corvallis.

An ecological approach to natural resource planning: True ecosystem management. Kerry E. Vachta, Dept. of Forestry, Michigan State University, East Lansing.

Environmental ethics and the ethical acceptability of forest practices. Peter List, Dept. of Philosophy, Oregon State University, Corvallis.

Forest aesthetics, biodiversity, and the perceived appropriateness of ecosystem management practices. Paul H. Gobster, USDA Forest Service, North Central Forest Experiment Station, Chicago.

My talk to the forestry class. Chris Anderson, Dept. of English, Oregon State University, Corvallis (currently on sabbatical leave at Mt. Angel Seminary, Mount Angel, Ore.)

Social acceptability from the perspective of anthropology and cultural geography. Richard Hansis, Washington State University, Vancouver.

Socially acceptable forestry: Compromised solution or naturalized ideology? Walter F. Kuentzel, School of Natural Resources, University of Vermont, Burlington.

What the public values: Defining social acceptability in new forestry practices. Katrina Rogers, High West Center for Environmental Policy Studies, Flagstaff, Ariz., (currently in Konstanz, Germany, studying on a Bundeskanzler Fellowship).

A Definition of 'Social Acceptability' in Ecosystem Management

This collection of papers culminates a research effort with a deceptively simple objective: to define "public acceptability" with regard to management practices and conditions in the national forests. When the USDA Forest Service's New Perspectives in Forestry research initiative was launched in 1990, its goals were to identify practices and policies that could (1) "maintain biodiversity" while (2) managing forests "to balance values and produce a sustained supply of goods and services" (Stankey and Clark, 1991, p. 12). The word acceptability appears in neither of those goals. Yet clearly an underlying impetus for New Perspectives was widespread and growing skepticism about the Forest Service's ability to sustain both the flow of resources and the forests that provide those resources. Simply put, the public increasingly found practices and conditions on the national forests to be unacceptable, and the Forest Service needed to find ways to reverse that trend.

If public acceptability is to be an explicit objective of national forest management, the Forest Service will require methods to measure acceptability of current practices, predict acceptability of proposed practices, and understand the reasons for failures to achieve acceptability. Yet when Stankey and Clark (1991) evaluated social science research problems associated with New Perspectives, they found that "there is inadequate understanding of what constitutes 'acceptability' with regard to the practice of New Perspectives and of the associated impacts of these differing conceptions" (p. 23).

Consequently the study was launched which ultimately produced this document as well as other papers exploring meanings of acceptability in a forestry context (Brunson 1992,

1993; Johnson and others, in press). In the intervening period, New Perspectives has evolved from a research initiative into agency policy, now called "ecosystem management." The latter is described by the Forest Service leadership as "a multiple-use philosophy built around ecological principles, sustainability, and a strong land stewardship ethic, with a better recognition of the spiritual values and natural beauty of the forests" (Robertson 1991, p. 19). Robertson's description implies certain requirements for future practices and conditions on federal forests:

- they must be ecologically sustainable, directing managed forests toward a "desired future condition" which embodies the complexity of ecosystem interrelationships at a variety of spatial and temporal scales;
- they must be economically feasible, meeting societal demands for the myriad products of forests at a cost that does not exceed the priced and unpriced benefits gained; and
- they must be socially acceptable, reflecting a sensitivity toward recreational, aesthetic, spiritual, and other non-commodity values of forests.

The adoption of ecosystem management therefore underscores the need to understand what socially acceptable forestry might be. The objective of this paper is to provide some foundation for that understanding. It offers a working definition of social acceptability, and discusses aspects of that definition that are likely to affect the implementation and evaluation of ecosystem management. The definition represents a synthesis of ideas about public judgment drawn from a number of disciplines including forestry, political science, sociology, psychology, landscape architecture, economics, and philosophy. Many of those ideas were found in an extensive literature review. Others were offered by my collaborators in this

document, during a June 1992 workshop in Kelso, Wash., and in the papers subsequently submitted for this collection. Blame for the synthesis, however, is entirely mine.

A DEFINITION OF SOCIAL ACCEPTABILITY

The first obvious step toward defining acceptability in a forestry context was to examine current conceptualizations in related applied fields as well as the basic social sciences. However, it quickly became apparent that acceptability itself rarely appears as a rigorously defined concept in basic social science. Authors write of norms, preferences, values, and so on, but it is not clear where acceptability fits in this conceptual framework. Is an "acceptable" condition one which violates a widely shared social norm, for example, or is it simply one that fails to reflect the preferences of whichever constituency group holds the balance of power? How does an "acceptable" condition differ from a "desired" condition?

If basic social science offered few answers, the forestry literature offered some answers but also created as many new questions. In the Forest Service, the term acceptable may be most familiar as part of the Limits of Acceptable Change system for wilderness planning (Stankey and others 1985). Although the authors did not define what they meant by "acceptable," they used the word in two ways: to describe what is legally permissible under the Wilderness Act of 1964, and to describe what wilderness users agree is desirable as determined during a consensus-driven planning process. What, then, does it mean for a wilderness condition to be "unacceptable"? Since legal mandates carry more weight in public policy than visitor preferences, the consequences of "unacceptability" may vary considerably.

Acceptability is also an objective of visual resource management, as noted in this

rather ambiguous passage from a manual published by the British Columbia Ministry of Forests (1981). The agency defined its scenic management challenge as being "to maintain acceptable forest landscapes and, at the same time, ensure that optimum economic and social benefits accrue to the people of the province" (p. 7). This statement seems to imply that acceptability somehow exists apart from economic or social influences, and may even be antithetical to societal needs -- even though clearly it is society which must do the accepting.

Even though the term acceptability is not used, much has been written about the ways by which humans judge environments. Based on this a tentative definition could be crafted:

Social acceptability in forest management results from a judgmental process by which individuals (1) compare the perceived reality with its known alternatives; and (2) decide whether the "real" condition is superior, or sufficiently similar, to the most favorable alternative condition. If the existing condition is not judged to be sufficient, the individual will initiate behavior -- often, but not always, within a constituency group -- that is believed likely to shift conditions toward a more favorable alternative.

IMPLICATIONS OF THE DEFINITION

Several aspects of this definition have implications for a policy objective of achieving public acceptability in ecosystem management. Acceptability is characterized as a product of individual judgments, but it is susceptible to group influences and provides an impetus for group behaviors. Judgments of acceptability are said to be a result of a comparison process, thereby suggesting that (1) there must be something with which to compare and (2) certain general rules will govern the comparative process. Acceptability is said to be reflected by

behaviors rather than simply by attitudes toward a forest practice or condition, although it is understood that behaviors are usually stimulated by attitudes. And finally, acceptability is said to be generally not observable, but rather something that must be inferred from the absence of overt behavior indicating a failure to achieve it.

Individual Judgments in a Social Context

Management decisions regarding government-controlled resources must consider the impacts of those decisions on an aggregation of persons we call the public. Yet really there is no such thing. Public opinion exists only as a "constitutionally institutionalized norm" (Habermas 1989); we behave as though it were something more because democracy cannot function if we do not do so. But "the public" is in fact a constantly shifting set of interpersonal affiliations, each of which can be characterized in terms of positive or negative responses to governmental actions commonly expressed by its members.

Ultimately those responses are the result of individual humans making choices based on available information. Because much of that information is filtered through the network of interpersonal affiliations, individual judgments invariably are based in part on the perceived judgments of reference groups, i.e., groups to which a person belongs (or aspires to belong) which serve as standards for judging appropriate behaviors in situations when more direct cues such as previous personal experience are ambiguous or non-existent (Shibutani 1955). Few direct cues are available for evaluating ecosystem management due to its newness, therefore the influence of reference groups may be enhanced.

Carroll (1989) offered a relevant example of reference group influence on judgments about forest management. He found that "negative evaluation of the Forest Service serves as an important unifying theme for loggers in the study area. One logger candidly stated, 'I'm a logger, so I'm supposed to hate the Forest Service'" (p. 101). Therefore it might be difficult for a logger to offer a positive evaluation of a Forest Service initiative such as ecosystem management, especially if it is to be made in a setting where a number of loggers are present and are monitoring each others' responses (e.g., a public involvement meeting).

Efforts to shift a practice or condition from unacceptable to acceptable status (or at least to a position of neutrality) ultimately must be directed at individuals. Given the polarization that has characterized contemporary disputes between natural resource interest groups, it may be easier to achieve changes in acceptability judgments when individuals are most likely to respond as such, without the attitude-reinforcement dynamic found in group meetings. However, it is much more efficient to target new information at reference groups, which may be relied upon to subsequently influence the judgments of large numbers of their members. Probably the most effective information strategy will be one that targets both groups and individuals.

Dynamics of the Comparison Process

As noted previously, acceptability judgments are comparisons made based on available information. Clearly the first rule of comparison is that there must be a conceivable alternative to the condition or practice being evaluated. Conditions that are seen as unavoidable -- those that may be considered "acts of God" -- lie outside the realm of

acceptability judgment no matter how disastrous their consequences might be for natural or human environments. Similarly, no comparison can be made if an alternative exists but the evaluator is not aware of it.

Yet humans also have a psychological need to make attributions -- to assign causes to the behaviors and circumstances we observe. As Heider (1958) pointed out, it is through attribution that we are able to organize the continuous stream of information we receive from the world into meaningful units. Therefore we can expect members of the public to judge forest conditions based on their beliefs about why the condition is present. If it is perceived to be "natural," it is likely to be acceptable. This may be true if the natural cause has no alternative or, if an alternative does exist, because ours is a culture which increasingly equates nature with rightness (List, this proceedings). Conversely, if environmental disasters are seen as resulting from human activities or decisions, as many people believed concerning the 1988 fires in Yellowstone National Park (e.g. Buck 1989), the resulting condition may be unacceptable despite its natural origin.

If a forest condition is perceived to have human origin or design, its acceptability is likely to depend upon a judgment about the practice that created it. The acceptability of the practice will depend, at least in part, upon its perceived objective. Surveys conducted during ecosystem management field tours found that the most positive responses commonly referred to the purpose of the new approaches to forestry being demonstrated (Brunson 1992). Ecosystem management was presented during the tours as an honest attempt to maintain diversity of species and ecosystem components, and tour participants accepted that characterization. As long as that continues to be true, then people may find ecosystem

management practices generally acceptable even if they dislike the "sloppy" forest conditions they temporarily create.

Just as a desirable objective can make a somewhat objectionable practice more acceptable, the reverse is also true: the acceptability of the ends may depend on the acceptability of the means employed to achieve it. To be acceptable, ecosystem management must be seen as the best (or a good enough) means to achieve biodiversity and ecological sustainability. To decide which of several alternatives is "best," an evaluator must weigh the desirability, equitability, and feasibility of each alternative.

The easiest of these factors to evaluate is desirability. Anyone can decide which outcome they want the most; more information is needed to judge feasibility and equitability. Some evaluators may not possess that information. Foresters sometimes complain that public demands (for example, a ban on clearcutting) are made with little understanding of the consequences. Certainly some people are unaware how much less efficient it is to grow many timber species in an uneven-age condition, and some of those people might find clearcutting more acceptable if they understood all of the economic and biological factors behind a decision to clearcut. However, it is also true that others would decide that uneven-age silviculture is preferable as long as it is even marginally feasible. The difference is that evaluation process used by those in the former group put more weight on feasibility; for them, a less feasible alternative may be judged less acceptable even though it promises more favorable results if successful. (Low feasibility here may imply higher economic costs, or a lower probability of success.)

Similarly, a desirable outcome may be rejected if the outcome appears unfair to a particular constituency group. Issues of fairness do enter into natural resource politics. Recent research on attitudes toward forest and rangeland management has suggested that while Americans do want to de-emphasize commodity production, they also worry about the effects of such a change on resource-dependent communities. Thus they repeatedly say that local community needs should receive the highest priority in making decisions about forests or rangelands (Shindler and others 1993, Brunson and Steel 1993), and they prefer that any increase in federal grazing fees be phased in rather than taking place immediately (Brunson and Steel 1993).

Related to both feasibility and equitability is the question of risk. Slovic (1987) characterized risk as two-dimensional: one dimension describing the fatality and global extent of risks, and one describing the extent to which risks are currently known. Forestry ranks low on the first dimension, but high on the second. Because mature forest ecosystems develop slowly, many years can pass between a decision and recognition of its consequences. We can predict the condition an ecosystem management practice will produce in 50 or 100 years, but we have no experimental evidence. Risks of an error in judgment (a decision's ultimate feasibility) are not entirely knowable, and any adverse results are likely to be borne (inequitably) by generations which had no opportunity to prevent its occurrence.

A final general rule governing the acceptability judgment process is that practices and conditions are judged in a geographic context. An obvious example of this is the so-called NIMBY (not in my backyard) syndrome. In a study of the scenic impact of partial-harvest practices associated with ecosystem management, Johnson and others (in press) found that 57

percent of urban/forest interface residents would rate a partial harvest acceptable at an unidentified location, but only 32 percent rated the same scene acceptable in a stand adjacent to their own backyards. The influence of geography is not simply a matter of self-interest, however. An example is offered by the environmental activist who was asked during one ecosystem management field tour how he felt about an experimental harvest unit. He replied that while it illustrated a real step toward sustainable forestry, he was dissatisfied because that watershed had already been extensively logged, and he felt no more harvest there was warranted even if it was designed to enhance biodiversity in the regenerated stand.

Attitude-Behavior Links and the Measurement Problem

Because acceptability is a product of cognitive judgments, it is a description of one's attitudinal orientation toward forest conditions or practices. Yet the definition here refers not to attitudes, but to behaviors. Once a judgment has been made, an evaluator decides what (if anything) to do in response to that judgment. If the judgment is favorable -- i.e., the condition or practice is acceptable -- quite likely no behavior will be initiated. No recreation visit will be cut short; no local TV station will be alerted to "environmental destruction" by the Forest Service; no angry letter will be written to a member of Congress. Because North Americans are much more likely to criticize a bad bureaucracy than to praise a good one, only rarely will a supportive behavior be initiated in response to an acceptability judgment.

If the judgment is not favorable, the evaluator faces a choice: is it so unfavorable that action needs to be taken to shift the condition or practice toward a more acceptable state? Only if the latter choice is made should we say that the situation is "unacceptable" for

purposes of ecosystem management. What I am arguing here is that if the evaluation is not sufficiently unfavorable to elicit an ameliorative behavior, the condition really is neither acceptable nor unacceptable, and is not necessary for a managing agency to respond. This distinction is made for two reasons. The first reason is that people's attitudes may not always reflect the actions they want taken. It makes little sense for managers to try to respond to every shift in attitude even before it is strong enough or stable enough to cause the public to want something done. The second reason is that behaviors can be monitored and measured more easily and more efficiently than attitudes. While periodic "attitude checks" are a critical part of a socially responsive democracy, behaviors provide a more cost-effective early warning system of the need for a change in policy or practice.

Social psychologists have long wrestled with the problem of consistency between attitudes and behaviors. The theory of reasoned action (Ajzen and Fishbein 1980) holds that behavior is linked most consistently with behavioral intention, and even then, circumstances may intervene. For example, I may intend to stop visiting a certain favorite campsite because logging-related sediment has reduced fish populations, but find myself camping there anyway because an alternative site is occupied or because my family prefers that site for other reasons.

Attitudes are less closely related to behaviors. They may change because of new information received before any behavior is instigated. They may never translate into action because the attitude is not held strongly enough to warrant expending the personal resources (time, money, energy) likely to change the situation. Or an individual may prefer not to behave consistently with an attitude because the behavior would not be sanctioned by an

important reference group. In each case, action by an agency in response to the attitude is unwarranted, either because the action is unlikely to satisfy the evaluator in the long term or because the evaluator does not really care whether the action is taken or not.

When behavioral scientists ask research subjects to identify ranges of acceptable and unacceptable conditions, these ranges are not always contiguous (Petty and Cacioppo 1981; Williams and others 1992). Often there is some mid-range situation about which respondents are non-committal. The definition of acceptability offered here implies that such mid-range evaluations should be considered acceptable even though, in fact, they are not. Elsewhere (Brunson 1993) I have warned that such a consideration could create a situation whereby ecosystem management produces a barely adequate forest (capable of being endured) rather than one that is pleasing to its constituencies (capable of being praised). However, there really are two questions here -- one of policy and one of measurement.

The policy question is this: If foresters strive for social acceptability, are they shooting for a suitable target or sinking to an endurable threshold? The answer will depend partly on whether forestry is perceived as a social good or a necessary evil. For example, if one assumes that "the public" views all timber harvest as degrading to the forest, then the task becomes one of defining how much degradation society is willing to withstand. But if one assumes that some timber harvest is desirable -- because it provides products beneficial to society -- while too much harvest is detrimental, the policy objective is more likely to be to strive for a "desired future condition" rather than a "tolerable future condition."

Clearly the target approach is a more palatable guideline for policy than the threshold approach. We expect our ecosystem managers to seek a desired condition; in fact, the term

desired future condition is now part of the Forest Service planning lexicon. But how will managers know whether they are on the proper trajectory toward the desired target? Here is where the measurement issue arises. An agency could continuously monitor public attitudes, repeatedly asking people how they are doing, and succeed primarily in annoying a public that has other things to do than respond to government surveys. Not only would such a program be impossibly cumbersome, but it would detract from the other role of public land managers, which is to make scientifically based professional judgments about ecosystems.

Alternatively, a well-designed and truly collaborative public participation process could be used to define the bounds of possible trajectories. Managers could then choose from among those trajectories based on their scientific knowledge and economic realities. If the participation process is handled properly and repeated often enough, and if the managers are monitoring social behavior sufficiently well to notice when the trajectory no longer falls within the socially defined boundaries, it should not be necessary to monitor attitudes on a continuous basis. Behaviors that indicate unacceptability -- expressions of dissatisfaction, whether through political action or simply "voting with one's feet" -- are more indicative of a real diversion from the optimal trajectory than attitudes which may never lead to behaviors.

This "mixed-scanning" approach (Etzioni 1973) acknowledges that the quest for optimal solutions is rarely attainable under conditions of even moderate uncertainty (Simon 1959), yet it avoids the "tyranny of small decisions" that can arise from an incrementalist, step-by-step approach to planning. Skeptics may notice that mixed-scanning resembles, at least philosophically, the Forest Service planning efforts of the 1980s -- the shortcomings of which contributed greatly to the need to adopt ecosystem management. Yet while those

efforts came under heavy and well-deserved criticism, the mixed-scanning approach can be used effectively if the agencies truly watch for signs of unacceptability. Even more importantly, they must be truly willing to make the necessary adjustments if behavioral monitoring or periodic attitude checks make it clear that a practice or condition no longer meets the ecosystem management objective of social acceptability.

CONCLUSION

One of the continuing problems associated with ecosystem management is the lack of rigorous definitions for its associated concepts. This is not uncommon for an evolving body of theory and practice, and in fact may be symptomatic of the vibrancy of forest science and management. Even definitions of ecosystem management itself tend to lack rigor. Typically they are expressed in generalities, as in Robertson's (1991) definition reprinted in the introduction to this paper, or in terms of objectives as in my own description which immediately follows Robertson's. Nonetheless, these descriptions do have common elements. Ecosystem management is meant to be holistic, incorporating both sociopolitical and biophysical systems. It is meant to focus not on the outputs that flow from the forest, but on the condition of the forest that remains. It is meant to be sustainable, to preserve biodiversity, to reflect the natural processes so that ecosystem integrity is maintained at the landscape level. It is meant to be responsive to the broad range of social values in a way that is equitable to both urban and rural resource-dependent communities.

This list of agreed-upon elements contains a number of vague terms that are troubling to some foresters: holistic, sustainable, biodiversity, ecosystem integrity, social values. In a

recent issue of Journal of Forestry, for example, Hill (1993) asks: "What are the key elements of 'forest condition' to be maintained in meeting ecosystem management goals? ... What is a landscape? How large is a landscape?" (p. 34). All are good, basic questions. Foresters' unease is great enough that a committee of the Society of American Foresters chose to omit the word "sustainability" from its land ethic canon because no one could agree on what it was that was to be sustained (Craig 1992).

The attempt in this paper was to provide some structure to at least one of these slippery concepts. A definition of social acceptability was offered that considered such questions as who does the accepting, how the decision is made, what the consequences of a decision can be, and how to observe acceptability through its consequences. Much more can be said on this issue. Brunson (1993) offers an expanded discussion of the implications of the social acceptability judgment process for ecosystem managers. The papers that follow examine that same issue, and many others. A definition does not solve any of the problems associated with the social acceptability of natural resource management, however one can hope that it provides a useful framework for beginning the problem-solving task.

The Social Context of Ecosystem Management: Unanswered Questions and Unresolved Issues

A frequent consequence of intensive research on a new topic is that we discover not only new knowledge, but also how much more we do not know. The articles in this report go a long way toward addressing Stankey and Clark's (1991) concern that "there is inadequate understanding of what constitutes 'acceptability' with regard to the practice of New Perspectives and of the associated impacts of these differing conceptions." We have seen how that understanding can be enhanced by examining the literatures of sociology, social psychology, history, anthropology, philosophy and political theory. We also have seen how disciplines as diverse as psychology, political science, landscape architecture and forestry can offer tools for studying the social context of forestry and incorporating social concerns into forest management. A working definition of social acceptability in ecosystem management has also been offered.

Yet this research has also helped us to identify other, emerging issues: questions about ecosystem management as an idea, about its implementability, and about specific aspects of ecosystem management practices and conditions. This final paper describes some of the more critical of these emerging problems, including ones that are central to the future of the ecosystem management concept as well as those most likely to elicit public expressions of concern about the forests being managed using an ecosystem approach.

The analysis draws on two principal sources: academic and political writings and discussions; and comments made by members of various national forest constituencies. The first category includes discussions at the June 1992 workshop which led to this report, as

well as the rapidly growing literature on ecosystem management, "new forestry," New Perspectives and related concepts. The second category of sources encompasses a large number of statements made by interested persons as they learned about new approaches to forestry during the period from September 1990 to June 1992. Although the research was conducted in the Pacific Northwest, the questions that arose are likely to be applicable throughout the United States and Canada.

GATHERING PUBLIC REACTIONS

As momentum built up in the New Perspectives initiative (1990-92) and related "new forestry" movement, forestry entities began to develop research and demonstration areas highlighting ecosystem management concepts. In the Northwest, locations for these projects included the Forest Service's H.J. Andrews Experimental Forest near Blue River, Ore.; the Oregon State University (OSU) research forest at Corvallis; Seattle's city watershed near North Bend, Wash.; and several Plum Creek Timber Co. tracts in western Washington. As forest interest groups became aware of these efforts, they often asked (or were invited) to attend ecosystem management demonstration tours of those sites. A sampling of these tours provided the research setting for this phase of the study.

On several tours, I asked participants to complete questionnaires about their reactions to tour stops or topics. Questions and comments directed to tour leaders were recorded on those same tours as well as several others where surveys were not administered. Additional data came from interviews of visitors at the OSU research forest and from audience questions and comments at public forums in Corvallis and Eugene, Ore. The study was in some ways

analogous to the "scoping" process in federal environmental impact assessments; its objective was to describe in ideographic fashion the broad range of social values that might be affected by the implementation of what we now call ecosystem management.

Data gathering and analysis combined qualitative and quantitative methods, with emphasis on the former. Open and axial coding processes (Strauss and Corbin 1990) were used to develop a typology of reactions to ecosystem management practices, conditions, and objectives. The primary intent was not to measure the depth of support or opposition, nor to rank the importance of issues or concerns, but to catalog and categorize issues that arose and to identify ones that arose most frequently and/or crossed constituency group boundaries.

Foresters and scientists in related fields made up the primary audience for field tours and off-site forums. However, participants also included public school teachers, liberal arts and science students at Oregon State University and Linfield College, and environmental group members. Respondents typically lived in the Northwest, visited forests regularly for recreation, and had some post-high school coursework in forestry or biology. Responses to an attitude scale (McCool and others, 1986) showed that tour groups ranged from moderately commodity-oriented to highly amenity-oriented in their beliefs about the proper role of forestry. Post-tour questions found generally positive attitudes toward ecosystem management concepts and practices. Nearly half of the respondents preferred alternative techniques to standard silvicultural and timber harvest methods. Further details about methods and the research sample are given in Brunson (1992).

A FUNDAMENTAL ACCEPTABILITY QUESTION

The most basic question surrounding the social acceptability of ecosystem management is whether the ecosystem management concept itself is socially acceptable. As Franklin (1989) recounted, the architects of what we now call ecosystem management were initially interested in biophysical questions: How does timber cutting affect streams? What is the role of woody debris in forest ecosystems? How diverse is invertebrate life in old growth forest canopies? Only after a complex picture of forest ecosystems began to emerge, and the search began for a unified theory of management for ecosystem components, did they realize their "new forestry" might also offer an answer to a sociopolitical question: Is there an alternative to the stark choice between tree farms and total preservation?

The belief of forest ecologists was (and is) that the answer to that question would be yes: Yes, such an alternative exists; yes, ecosystem science can offer that alternative. And most relevant to this discussion: Yes, the public will welcome the scientists' alternative. This last assumption needs testing. The underlying acceptability of the ecosystem management idea has been largely unconsidered. In this section, I will first discuss some reasons why it has not been tested, and then discuss reasons why there might be variation in public attitudes toward the concept of ecosystem management.

Ecosystem management as moral imperative

Surely there are several reasons why agency professionals and forest scientists have largely ignored the overriding question of whether ecosystem management itself is a socially acceptable concept. Perhaps the simplest one is that it is obvious something different must

be done, and ecosystem management seems the most palatable known alternative. Moreover, as the concept has evolved it has acquired a number of socially responsive trappings -- e.g., a commitment to more substantive public participation earlier in the decision-making process -- which are clearly designed to meet public criticisms of forest management. But the addition of these sociopolitical mechanisms serves to disguise the original question of whether the biophysical basis of ecosystem management is socially acceptable.

When fundamental assumptions go unquestioned, it is most often because the assumer cannot conceive of an alternative. In other words, the assumption is rooted in paradigmatic and/or ideological characteristics of the group (professional discipline, culture, etc.) making the assumption. Stankey (this proceedings) and Lewis (this proceedings) offered detailed and illuminating perspectives on how the natural resource professions have adhered to a "rational-technical paradigm." Given this professional orientation, it is not hard to see how forest managers might accept on faith the notion that the current problem confronting forestry can only be addressed through a scientifically derived, technologically based solution.

Further ideological explanation can be found in the growing adherence of resource managers, as well as natural scientists and environmentalists, to a biocentric ethic (Brown and Harris 1992). In the ideology of modern conservation, "biocentric" management -- that which sets the needs of the human species no higher than those of any other species within a given ecosystem -- occupies a kind of moral high ground. This idea can be traced to Aldo Leopold's (1966) essay "The Land Ethic," often cited a primary intellectual influence by both applied and basic natural scientists. Leopold saw ethics, which he defined as the impetus for individuals to cooperate with others in a community, following an evolutionary progression.

He described how "community" has widened over the centuries from its original application (an adult male power structure) to encompass wives, slaves, children, and people of other races. The land ethic "simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land" (p. 239). By describing this extension of ethics as both an "ecological necessity" and as the next step in an evolutionary sequence, Leopold presented biocentrism as an inevitable advancement to a higher moral plain.

By implication, those who espouse biocentrism can be seen as morally superior to those who do not. A corollary to this viewpoint is that initiatives rooted in biocentrism similarly may be preferable based on moral or ethical grounds. In such case, one can conclude that it is neither necessary nor socially beneficial to ask the larger society whether it wants to adopt a biocentrically driven stratagem. (After all, we no longer ask if society wants to own slaves, or to send its children to work in sweatshops.) Ecosystem management has as its twin pillars the biocentric ideals of biodiversity and sustainability, so it may not be obvious to biocentric scientists that anyone who understands it could ethically object to it.

Alternative models of forest management

But large segments of American society see humans and their destiny differently. Many people see humans as having been set apart from other organisms by Biblical fiat; they may not believe that ecosystem management fits their obligations toward the earth. Many others simply doubt that humanity has progressed very far along any moral or intellectual continuum. The central idea of ecosystem management is that *natural resource professionals can manipulate forests, grasslands, and other environmental systems in a way that mimics*

natural biophysical processes so that those systems can function as evolution intended, with all of their diverse components intact, while the human society obtains a suitably wide range of socially desirable products. By adopting ecosystem management as a guiding principle, the Forest Service is expressing its confidence that such manipulation both can be done and will be done. Not everyone is so convinced.

Beliefs about the ecosystem management concept are dependent on issues of trust and risk. To support ecosystem management requires trust -- trust in fundamental concepts of resource management, in government employees, in science itself. Many people believe the Forest Service is uninterested in preserving ecosystems or biological diversity. Such distrust is clear in the environmental advocacy literature: e.g., Zuckerman's (1992) characterization of the new approach to forestry as "new hype," or Kerr's (1990) memorable description: "a kinder, gentler form of rape" (p. 22). Even in academic writing we find statements such as this from Frissell and others (1992) in the journal Conservation Biology: "Recent court decisions and congressional hearings have gruesomely exposed that the drive to extract timber subjugates virtually all other considerations within the U.S. Forest Service" (p. 461).

Beyond the question of agency intent is the question of scientific fallibility and risk. To again quote Frissell and others (1992): "The argument for the role of wilderness in conservation does not derive simply from the assumption that 'nature-knows-best.' It springs from the assumption that despite good intentions (and a few bad ones), humans, and bureaucratic systems like the Forest Services, do not always know what is best" (p. 462). In essence, two questions are being posed here: Do forest managers have the political will to manipulate forests in ways that truly mimic natural processes? And do they have the

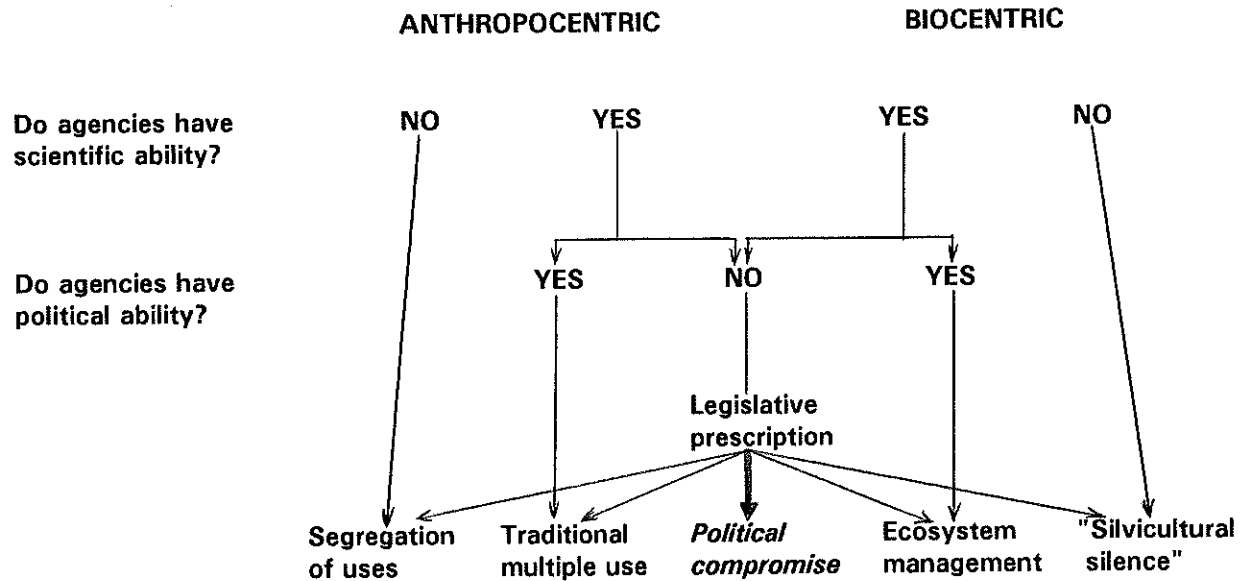


Figure 1--Typology of preferences for alternative models of public forest management.

scientific knowledge to do so? Based on the earlier discussion of underlying ideologies, we must add a third question: Is a biocentric model of natural resource management the proper one for forestry to follow? Only if the answer to all three question is yes will ecosystem management appear to be the most appropriate path for foresters to follow.

Figure 1 displays how differing responses to those three questions can lead to five or more different preferred models of future resource management. We begin by considering the ideological question: Should society manage significant portions of public forest land for the production of timber or other high-value commodities even if such production reduces the land's capability to provide unpriced or amenity resources? If the answer is yes, an anthropocentric track (left side of diagram) will be followed. If not, a biocentric track will be chosen. The second question concerns ecological risk: Do we possess sufficient scientific knowledge about forests to successfully implement strategies that permit acceptable flows of

non-emphasized resources while maintaining optimal flows of commodities? And the final question concerns political trust: Do the agencies have the ability or desire to withstand interest group pressures that may shift management away from an optimal path?

No matter whether one prefers an anthropocentric or biocentric approach to management, acceptance of ecosystem management is less likely if one has little faith in agency capabilities. If an individual believes commodity primacy is appropriate in some locations, but does not have faith in the agency's capacity to practice a scientifically defensible brand of integrative forestry (i.e., a "new and improved" multiple use), he or she may prefer a New Zealand-style "segregated management" approach where lands are divided into single-resource units for timber production, recreation, biological reserves, etc.

Conversely, those who believe neither in commodity primacy nor the agency's capacity to practice integrative forestry may well opt for a hands-off policy, one which environmental ethicist Peter List described at the Kelso workshop as "silvicultural silence." The silvicultural silence approach is consistent with strong environmentalist perspectives such as that of the deep ecologists (Devall and Sessions 1985), who see human degradation of the non-human world as excessive and rapidly worsening as a result of intrinsic negative aspects of the human condition. Such people place higher value on those aspects of nature in which man's role is largely invisible or non-existent. This is reflected in the statements of Frissell and others (1992) as noted above, and also in aesthetic orientations such as those expressed by Rolston and Coufal (1991): "Forests are never ugly; they are only more or less beautiful; the scale runs from zero upward with no negative domain. Even the 'ruined' forest, regenerating itself, has positive esthetic qualities, when trees rise to fill the space against the

sky" (p. 39). Thus even if a forest is "ruined" by humans, it reacquires beauty through the simple means of its innate restorative capacity, "regenerating itself" without human aid.

Even if one has faith in the scientific capacities of the agencies and associated applied sciences, one still may not decide that ecosystem management is the most acceptable solution to the current socially defined problem in forestry. A biocentrist might opt for ecosystem management. But an anthropocentrist may prefer a fine-tuning of the traditional multiple use approach, wherein commodity primacy remains the principal tenet while non-commodity values are somehow given a more cosmetic level of attention. And if one doesn't trust the agencies to have sufficient political will to manage in the "right" way (whatever one thinks that way is), the preferred approach is likely to be some sort of prescriptive legislation that limits managerial flexibility and forces the agencies to manage in a particular way. The legislative prescription approach might lead to any one of the other four models. Or, perhaps more likely, it could lead to a fifth "hybrid" model arising from a politically negotiated compromise. This model would probably contain elements of all four of the others, but in an as-yet-unknown (and perhaps unrecognizable) form.

All of these approaches have adherents both within and outside the forestry profession. It is not clear, however, which approach the "general public" prefers. Research on the New Environmental Paradigm (Catton and Dunlap 1980) suggests that the public is moving away from a preference for commodity-oriented management and toward a more biocentric approach. Several recent surveys by Steel and his colleagues (e.g., Shindler and others 1993; Brunson and Steel, in press) have included a question asking members of the public to choose among three models of natural resource management: an agricultural

approach that emphasizes commodity production, a multiple benefits approach emphasizing "a long-term sustainable balance between human and ecological concerns," and a preservation approach where human interference is minimized. Typically two-thirds of respondents choose the multiple benefits approach; of the remainder, twice as many generally favor the preservation model as favor the agricultural one.

These results may tend to suggest that the public will react favorably to ecosystem management if they believe it is possible. Clearly a multiple-benefits approach is favored over either timber primacy or silvicultural silence in theory. Moreover, statements during the field tours suggest that positive reactions to ecosystem management are positively associated with knowledge about ecosystems. Similarly, in a study of scenic impacts of alternative silviculture (Brunson 1991), knowledge about the purposes of silvicultural practices appeared to mitigate, though not alleviate, adverse reactions to their scenic impacts. Yet if lingering doubts about science are reinforced by early failures, the political debate may shift toward greater acceptance of "silvicultural silence."

RISK, UNCERTAINTY, AND RECREANCY

For the sociopolitical as well as the ecological aspects of ecosystem management, acceptance is greatly influenced by perceptions of risk and uncertainty. A constant theme during field tours and public forums was that any changes in forestry practice may have unforeseen consequences. Ecosystem management critics within the forestry profession often point to a lack of scientific ground-truthing and precise objectives and definitions. They

decry the speed at which ecosystem management progressed from idea to national policy (e.g., Atkinson 1992). As Fiedler (1992) put it, the skeptics "are unwilling to jump on the latest bandwagon, having seen the wheels come off so many wagons before" (p. 2).

This theme was voiced frequently on field tours, not only by those who disapproved of the ecosystem management concept in principle, but also by those who were favorably disposed but preferred a more cautious shift to the new approach. Many non-foresters also were concerned about uncertainty. Some environmentalists believe there are catastrophic risks associated with human intervention that outweigh any potential benefits (see Kerr 1990 for an expression of this view). Others simply noted that if we not know the risks of failure, they would prefer not to require their children or grandchildren to find out the hard way.

As noted previously, risk will be a key factor in decisions about the social acceptability of ecosystem management. Fischhoff and others (1981) described the acceptable-risk question in terms of five problems: (1) ambiguities in how to define the problem; (2) difficulties in ascertaining facts about the matter; (3) uncertainty about whose values are to be represented and how they are to be elicited; (4) the inevitable infallibility of experts; and (5) questions about how to evaluate the quality of the decision process.

All five of these apply to ecosystem management. The concept itself has not been rigorously defined. We have already seen the difficulties associated with defining public acceptability; concepts such as biodiversity and sustainability are likewise difficult to pin down. A Society of American Foresters task force recently opted to omit any reference to "sustainability" in the SAF code of ethics because members could not specify exactly what in forests should be sustained (Craig 1992). Facts are also questioned -- facts arising from

recent research on ecological processes and conditions, as well as about the extent to which traditional practice has harmed forest ecosystems. Equally contentious are debates about which stakeholders and which values should be emphasized in national forest management.

An especially thorny issue is expert fallibility. Mistakes in slow-growing forests take a long time to detect or correct. Scientific predictions about eventual effects of ecosystem management are not easily verifiable, and the public increasingly doubts whether science can offer unbiased information or produce technologies capable of protecting natural systems (Steel and others, in press; Brunson and Steel, in press). The length of time between treatment and outcome also complicates the choice of an evaluation strategy. If the results may not become known for a century or more, when can we decide whether ecosystem management works?

A critical factor in risk perception associated with ecosystem management is that the risks accrue to commonly held lands where decisions rest in the hands of a government bureaucracy. A recent nationwide survey (Brunson and Steel 1994) found that fewer than one-third of Americans have "a great deal" of confidence in the stewardship of the Forest Service and Bureau of Land Management, while somewhat more than one-third had "hardly any" confidence in those agencies. Confidence levels were even lower in Oregon, where there is more day-to-day contact with those agencies. Lack of confidence probably arises from disagreements about the proper role of agency resource management coming from both ends of the preservation-utilization spectrum. Nonetheless, clearly there is widespread public skepticism that a federal agency can manage "our" public lands.

Freudenburg (1993) refers to this problem as recreancy: the perceived failure of institutional actors to carry out their responsibilities with the degree of vigor necessary to merit the societal trust they enjoy. Freudenburg argues that as societies become more specialized, with greater division of labor, individuals must place greater responsibility for their fates in the hands of unknown others. Responsibilities for most things are shared, and sometimes problems can arise if any one of the responsibility-sharers fails to meet his or her or its expectations.

When institutions are recreant, it is difficult to assign blame. We attribute negative causes to government bureaucracies as surrogates for the wider network of institutions that shared responsibility. Thus the Love Canal incident is not only the fault of corporate greed, but also of regulators' failure to adequately recognize and protect society from that greed. Moreover, the corporation has gone away but the bureaucracy remains, a living memorial to the disaster. Similarly, forest management agencies may assume blame for institutional failures associated with changing forest conditions. Under such circumstances it may be difficult for the public to believe the agency can avoid the next institutional failure.

Communication as a risk-reduction strategy

In surveys of community activists, Freudenberg (1984) commonly heard complaints that government agencies failed to facilitate, or even actively blocked, access to information about environmental hazards. Recreancy-related problems might be mitigated through active facilitation strategies within forestry agencies -- programs for enhancing and maintaining communication about all aspects of ecosystem management, including risks and failures.

Indeed, a critical element in addressing all of these uncertainty-related issues will be communication between managers who are practicing ecosystem management, scientists who are evaluating its effects, and publics whose values and benefits are dependent on continued health of forest ecosystems.

In the Pacific Northwest Region of the Forest Service, scientists and managers have established several "learning centers," the purpose of which is to provide settings and/or infrastructure necessary to study ecosystem management methods as well as basic science, and to communicate their findings to managers and the public. As of this writing, there are five such learning centers in the region.¹ Each differs at least slightly from the others in its ecological system of interest, its primary research questions, and the model of research, application, and technology transfer it employs. Given the importance of this work, an analysis of the learning center approach should be undertaken with a goal of answering this question: Which learning center models are able to most effectively maintain open communications channels between scientists, managers, and publics?

SENSITIVE ASPECTS OF ECOSYSTEM MANAGEMENT PRACTICE

Dozens of questions about ecosystem management will occupy the attention of scientists and managers both within and outside learning centers. Some of these questions are much more likely than others to strike a nerve with a broader public. Once the hundreds of questions and comments made during this study had been collated and categorized, seven

¹Blue Mountains Learning Center, LaGrande, Ore.; Cascade Center for Ecosystem Management, Blue River, Ore.; Columbia Learning Center, Vancouver, Wash.; High Desert Learning Center, Bend, Ore.; and Olympic Learning Center, Quilcene, Wash.

issues stood out as eliciting the most widespread interest and concern. Four of these directly pertain to the relationship between forests and the wider society: public participation in ecosystem planning; political ramifications of adopting an ecosystem management approach; scenic impacts of non-traditional silviculture; and economic impacts of changing the mix of amenity and commodity resource outputs. The other three issues may affect the broad society less directly, but nonetheless may be likely to influence attitudes toward the new approach: growth and regeneration in stands harvested using non-traditional silviculture; safety of timber workers; and agencies' ability to monitor stand conditions and react swiftly if there is evidence of unanticipated problems.

Each of these issues can be described in terms of research questions that should be near the top of the scientific agenda for ecosystem managers because of their widespread interest and increased probability of affecting public attitudes toward ecosystem management. They involve a variety of social and biological sciences, and are offered in no particular order of importance:

1. How can private citizens' participation be routinely incorporated into the complex business of landscape-level planning? One of the key tenets of ecosystem management is that planning and management should occur at scales larger than the stand or site. Geographic context affects biophysical components of ecosystems just as it affects social components. However, landscape-level planning is more complex than stand-level or project-specific planning. Given the difficulties agencies have experienced in obtaining public involvement at these smaller scales, how can we expect to do it effectively at a larger scale?

2. Where does ecosystem management fit in the shifting "landscape" of political affiliations? Much of ecosystem management's appeal, especially for non-foresters and agency managers, lies in its perceived position as a compromise between preservationism and timber primacy. Yet even if the new approach occupies some sort of middle ground, it is not yet clear how politically defensible that ground might be. Critics from both sides of the environmental spectrum disparage ecosystem management in political terms, saying it's either too similar or too dissimilar to current practice. Research is needed that analyzes where support and opposition comes from, and the reasons for that support or opposition.

3. How do aesthetic preferences affect the acceptability of ecosystem management? As Gobster (this proceedings) points out, ecologically defensible forestry may not match the naturalistic form of scenic beauty that our culture prefers. Preliminary research (Brunson and Shelby 1992) suggests that alternative silvicultural practices are only slightly more palatable to the public than traditional clearcutting, and sometimes may be less so. Research is needed that compares a wide range of ecosystem management conditions to an equally wide range of traditional conditions. Studies also are needed that examine whether ecological knowledge can counteract negative scenic influences of ecosystem management practices.

4. What are the safety impacts of harvesting, planting, site preparation, and intermediate stand treatments under alternative silvicultural systems? Leaving standing snags, green trees, and down logs can increase the likelihood of accidents to timber workers. While this concern was not mentioned often, some felt passionately that this was the greatest problem associated with ecosystem management. If their outspoken opposition is borne out by the deaths of timber workers, adverse public reaction could be swift and volatile, drawing

in segments of society (e.g., urban organized labor) which are otherwise indifferent to forest policy issues. Research on ways to ease these threats is critically important.

5. What are the broad economic effects of ecosystem management, not only on timber harvest but also on other market resources from recreation to grazing to understory products?

Clearly ecosystem management will lead to reduced timber harvests, as evidenced by the two-thirds reduction in allowable harvest in the Clinton administration's proposed forest plan for the Northwest (Forest Ecosystem Management Assessment Team 1993). Preliminary estimates have been made of the economic cost of alternative silviculture in terms of timber production (Birch and Johnson 1992, Weigand and Burditt 1992), but other products have not been included in those calculations. As Iverson and Alston (1993) point out, economists need to broaden their focus beyond traditional products, "efficiency," and present net value if they are to provide the kinds of economic information that must be made available to ecosystem managers.

6. What are the broad silvicultural effects of ecosystem management on the growth of future post-harvest stands? Many traditionally trained foresters doubt that alternative silviculture can perform as promised. They know that trees grow well using traditional methods, and doubt that biodiversity gains can offset loss of timber productivity. If they are correct, a public facing rising lumber costs and little evidence of endangered species protection may turn against ecosystem management. As with the economic question, preliminary models suggest that growth and yield of timber species will indeed decline (Birch and Johnson 1992, Long and Roberts 1992) but little has been done to incorporate the effects on other species that may perform vital habitat functions in forest ecosystems.

7. How can we develop reliable (and reliably funded) monitoring strategies for ecosystem management? Responses to four surveys suggested that concerns about many of the above uncertainties could be eased if ecosystem managers are careful to make adaptive management (Swanson and Franklin 1992) a part of any proposal. Ecosystem managers must be able to keep close watch on the ramifications of their practices, and to react swiftly to problems as they arise. This is true not only for questions of public acceptability (as argued earlier in this paper), but also for questions about the effects on biophysical processes.

CONCLUSION

In this problem analysis, I have focused on two broad problems and a series of smaller ones. The broad ones concern our lack of knowledge about the acceptability of the underlying idea of ecosystem management, and the difficulties associated with facing the inherent risks of a fundamental change in forest management. Each of these, in turn, encompasses a number of sub-problems, only some of which are discussed here. In addition, research identified a set of seven issues that are especially likely to elicit concern about ecosystem management within one or more constituency groups.

I do not mean to imply, however, that these are all of the most important or pressing problems associated with the social acceptability of ecosystem management. Rather they are ones that rose to the surface most dramatically during a study in the Pacific Northwest -- a setting where timber harvest and endangered species are the principle forestry issues, where debate has focused on huge blocks of contiguous public lands, and where silvicultural manipulation has shown considerable promise for enhancement of multiple forest values. But

what of other regions -- where other commodities dominate rural economies, other patterns of land ownership predominate, or growing conditions severely limit silvicultural options?

Perhaps the most dramatic evidence of how region might affect this question comes from the recent debate within the Society of American Foresters (SAF) over application of ecosystem management or "sustainable forestry" practice to private lands. We do not know how to effectively manage ecosystems that cross multiple ownership boundaries, nor do we know the social implications of trying to do so. Cross-ownership issues (partnerships, regulation, etc.) were probably the most prominent topic at the 1993 SAF annual meeting -- the central focus of at least 10 plenary or concurrent sessions and featured prominently in many other sessions. Yet the cross-ownership question was barely raised in the Northwest, where history and geography have tended to limit the interspersal of public and private lands.

Clearly there is a need to undertake problem analyses similar to this one in other parts of the nation. One of the central tenets of ecosystem management is that practices must be fitted to the particular landscape; we should expect no less of our social science research.

Literature Cited

- Ajzen, Icek; Fishbein, Martin. 1980. Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall.
- Atkinson, William A. 1992. Silvicultural correctness: the politicization of forest science. *Western Wildlands*. 17(4):8-12.
- Birch, Kevin R.; Johnson, K. Norman. 1992. Stand-level wood-production costs of leaving live, mature trees at regeneration harvest in coastal Douglas-fir stands. *Western Journal of Applied Forestry*. 7(3):65-68.
- British Columbia Ministry of Forests. 1981. Forest Landscape Handbook. Victoria, B.C., Canada: Information Services Branch, Ministry of Forests. 97 p.
- Brown, Greg; Harris, Charles C. 1992. The U.S. Forest Service: Toward the new resource management paradigm? *Society and Natural Resources*. 5(3):231-246.
- Brunson, Mark W. 1991. Effects of traditional and "new forestry" practices on recreational and scenic quality of managed forests. Corvallis, OR: Oregon State University. 192 p. Ph.D. dissertation.
- Brunson, Mark W. 1992. Social acceptability of New Perspectives practices and conditions. Final project report prepared for the Cascade Center for Ecosystem Management, Consortium for the Social Values of Natural Resources, Olympic Natural Resources Center, and U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Brunson, Mark W. 1993. "Socially acceptable" forestry: what does it imply for ecosystem management? *Western Journal of Applied Forestry*. 8(4):1-4.
- Brunson, Mark W.; Shelby, Bo. 1992. Assessing recreational and scenic quality: how does "new forestry" rate? *Journal of Forestry*. 90(7):37-41.
- Brunson, Mark W.; Steel, Brent S. [In press]. National public attitudes toward federal rangeland management. *Rangelands*.
- Buck, Bill. 1989. A Yellowstone critique: something did go wrong. *Journal of Forestry*. 87(12):38-40.
- Carroll, Matthew S. 1989. Taming the lumberjack revisited. *Society and Natural Resources*. 2(2):91-106.

- Catton, William R.; Dunlap, Riley E. 1980. A new ecological paradigm for post-exuberant sociology. *American Behavioral Scientist*. 24:15-47.
- Craig, Ray. 1992. Land ethic canon proposal: a report for the task force. *Journal of Forestry*. 90(8):40-41.
- Devall, Bill; Sessions, George. 1985. *Deep ecology*. Salt Lake City: Peregrine Smith.
- Etzioni, Amitai. 1973. Mixed-scanning: a "third" approach to decision-making. In: Faludi, Andreas, ed. *A reader in planning theory*. Oxford, UK: Pergamon Press: 217-229.
- Fiedler, Carl. 1992. New forestry: concepts and applications. *Western Wildlands*. 17(4):2-7.
- Fischhoff, Baruch; Lichtenstein, Sarah; Slovic, Paul; [and others]. 1981. *Acceptable risk*. New York, NY: Cambridge University Press.
- Forest Ecosystem Management Assessment Team. 1993. *Forest ecosystem management: an ecological, economic, and social assessment*. Washington, DC: U.S. Department of Agriculture, Forest Service; U.S. Department of Commerce, National Marine Fisheries Service; U.S. Department of Interior, Bureau of Land Management, Fish and Wildlife Service, National Park Service; Environmental Protection Agency.
- Franklin, Jerry F. 1989. Toward a new forestry. *American Forests*. (Nov./Dec.): 37-44.
- Freudenberg, Nicholas. 1984. Citizen action for environmental health: report on a survey of community organizations. *American Journal of Public Health*. 74:444-448.
- Freudenburg, William R. 1993. Risk and recreancy: Weber, the division of labor, and the rationality of risk perceptions. *Social Forces*. 71(4):909-932.
- Habermas, Jürgen. 1989. *The structural transformation of the public sphere*. Burger, T.; Lawrence, F., translators. Cambridge, MA: The MIT Press. 301 p.
- Heider, Fritz. 1958. *The psychology of interpersonal relations*. New York, NY: John Wiley & Sons.
- Hill, Lawrence W. 1993. An open discussion is critical. *Journal of Forestry*. 91(7):34.
- Iverson, David C.; Alston, Richard M. 1993. Ecosystem-based forestry requires a broader economic focus. *Journal of Sustainable Forestry*. 1(2):97-106.
- Johnson, Rebecca L.; Brunson, Mark W.; Kimura, Takashi. [In press]. Using image capture technology to assess scenic value at the urban/forest interface: a case study. *Journal of Environmental Management*.

- Kerr, Andy. 1990. New (age) perspectives: glossy dogma to hide old habits. *Forest Watch*. October: 22-25.
- Leopold, Aldo. 1949. *A Sand County almanac, with essays on conservation from Round River*.
- Long, James N.; Roberts, Scott D. 1992. Growth and yield implications of a "new forestry" silvicultural system. *Western Journal of Applied Forestry*. 7(1):6-9.
- McCool, Stephen F.; Benson, Robert E.; Ashor, Joseph L. 1986. How the public perceives the visual effects of timber harvesting: an evaluation of interest group preferences. *Environmental Management*. 10(3):385-391.
- Petty, R.E.; Cacioppo, J.T. 1981. *Attitudes and persuasion: classic and contemporary approaches*. Dubuque, IA: William C. Brown.
- Robertson, F. Dale. 1991. The next 100 years of national forest management. *Transactions, North American Wildlife and Natural Resources Conference*. 56:19-21.
- Rolston, Holmes III; Coufal, James. 1991. A forest ethic and multivalued forest management. *Journal of Forestry*. 89(4):35-40.
- Shibutani, T. 1955. Reference groups as perspectives. *American Journal of Sociology*. 60: 562-659.
- Shindler, Bruce; List, Peter; Steel, Brent S. 1993. Managing federal forests: public attitudes in Oregon and nationwide. *Journal of Forestry*. 91(7):36-42.
- Simon, Herbert A. 1959. Theories of decision-making in economics and behavioral science. *American Economic Review*. 49(3):253-283.
- Stankey, George H.; Cole, David N.; Lucas, Robert C. [and others]. 1985. *The Limits of Acceptable Change (LAC) system for wilderness planning*. Gen. Tech. Rep. INT-176. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 37 p.
- Stankey, George H.; Clark, Roger N. 1991. *Social aspects of New Perspectives in Forestry: a problem analysis*. Milford, PA: Grey Towers Press.
- Steel, Brent S.; List, Peter; Shindler, Bruce. [In press]. *Conflicting values about federal forests: a comparison of national and Oregon publics*. *Society and Natural Resources*.
- Strauss, Anselm; Corbin, Juliet. 1990. *Basics of qualitative research: grounded theory procedures and techniques*. Newbury Park, Calif.: Sage Publications.

Swanson, Frederick J.; Franklin, Jerry F. 1992. New forestry principles from ecosystem analysis of Pacific Northwest forests. *Ecological Applications*. 2:262-274.

Weigand, James F.; Burditt, A. Lynn. 1992. Economic implications for management of structural retention on harvest units at the Blue River Ranger District, Willamette National Forest, Oregon. Res. Note PNW-510. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 17 p.

Williams, Daniel R.; Roggenbuck, Joseph W.; Patterson, Michael E.; Watson, Alan E. 1992. The variability of user-based social impact standards for wilderness management. *Forest Science*. 38(4):738-756.

Zuckerman, Seth. 1992. New forestry? New hype... *Sierra*. 77(2):40-45,67.