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Social Acceptability of Alternatives to Clearcutting: Discussion and Literature Review With Emphasis on Southeast Alaska



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Abstract

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Changing social contexts have necessitated a new approach to forest management. Growing dissatisfaction with clearcutting has made the USDA Forest Service the focus of criticism by various public interest groups. We discuss and provide a comprehensive annotated list of published and unpublished references on the subject of socially acceptable alternatives to clearcutting, with emphasis on southeast Alaska. The literature reveals that social acceptability is a complex synthesis of multiple opinions, values, and attitudes, and indicates that both qualitative and quantitative social science research are required to identify socially acceptable alternatives to clearcutting in southeast Alaska.

Keywords: Acceptability, Alaska, alternatives to clearcutting, clearcutting, forest management, Forest Service, forest values, public attitudes, social acceptability, social values, southeast Alaska, Tongass National Forest, values.

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Introduction

Changing social contexts have necessitated a new approach to forest management. Growing dissatisfaction with clearcutting has made the U.S. Department of Agriculture, Forest Service the focus of extreme criticism by various public interest groups. This paper discusses the scope and complexity of social alternatives to clearcutting.

We also have provided a comprehensive annotated list of published references on socially acceptable alternatives to clearcutting. This report is intended to be a resource and aid in designing additional social science research in this emerging field. Our emphasis is on literature pertinent to the issue as it exists in southeast Alaska, with the understanding that research needs to be designed for social and environmental conditions unique to the area. Literature on the subject reveals that social acceptability is a complex synthesis of multiple opinions, values, and attitudes. It also indicates that both qualitative and quantitative social science research are required to identify socially acceptable alternatives to clearcutting in southeast Alaska.

Context

Currently in the United States, natural resource managers are grappling with the need for public approval of management decisions and with the public's involvement in making these decisions (Brunson and Kennedy 1995). There has been a rapid change in forest values, types of value relations, and relative values assigned to forest-related objects (Bengston 1994). As a result, the USDA Forest Service has found itself the focus of extreme criticism by various public interest groups. Growing dissatisfaction with clearcutting is attributed to societal changes such as more urban populations, less direct dependence on commodity production, and a value shift from economic incentives toward aesthetic, recreational, and spiritual values (Fiedler 1992, Rogers 1996). Additionally, the concurrent growth of the environmental movement has created awareness of the forest ecosystem and concern for its health. Thus, the social context for forestry has changed, which in turn has necessitated a new approach to forest management.

The Forest Ecosystem Management Assessment Team (FEMAT) of the Forest Service pioneered the discussion of social assessment in forest management (Clark and Stankey 1994). Out of this effort came the understanding that forest management is both a social problem and a global problem, and solutions lie in inclusive, ongoing processes. Historically, the dominant social paradigm under which forest lands were managed emphasized economic growth, control of nature, faith in science and technology, an abundance of natural resources, substitutability of resources, and expert decisionmaking. Changes in the social context of forestry have resulted in the evolution of a new environmental paradigm that features sustainable development, harmony with nature, skepticism of scientific and technological fixes, finite natural resources, limits to substitution, and public involvement in decisionmaking (Bengston 1994).

The advent of "New Forestry," ecosystem management, and adaptive management in the Forest Service is the result of this paradigmatic shift (Behan 1990). The concept of New Forestry encompasses a philosophical perspective, a set of practices, and a new way of doing business. It is still evolving, with implications for educational institutions (what is taught), forestry research programs (what is studied), forest managers (management goals and decisions), and the public (their role and influence) (Clark

and Stankey 1991, Clark et al. 1999). The new ecosystem management paradigm envisions social science research integrated into forest management decisions. A “common language” for the social and biological sciences, however, is currently lacking (Brunson 1996a). Furthermore, the social-human aspects of ecosystem management will likely be as complex as the physical-biological system interactions (Williams, n.d.). For example, the context in which specific forest management activities occur is significant, and individually held values, level of knowledge, and group influence may be as important as the actual effect of forest management activities in determining their acceptability (Hansis 1996).

Recent sociological research on forest valuation indicates public values are shifting from an emphasis on economic values toward aesthetic values. The FEMAT (1993) explains the contemporary concept of social acceptability in forest management as derived from multiple factors including knowledge of the forest, held values, the site-specific context, perceived risk of harvesting, perceived agency motives, and the spatial context of the proposed action. Explicitly recognized forest values now encompass commodity, amenity, environmental quality, ecological, public use, and spiritual values (Stankey and Clark 1992). Issues that will affect future generations also are discussed when allocating forest resources and making forest management decisions.

The discipline of environmental sociology, emphasizing interactive reciprocal relations with the environment, is a young field with conceptual methodological difficulties in conducting research (Dunlap and Catton 1983). The meaning and values of forests change over time and space. There is a need to better understand specific attributes that contribute to acceptability and changes in perception through time and space. Public preferences for forest practices and forest conditions need to be better researched. Methods for measuring public acceptability need to be improved (Stankey and Clark 1992). Some researchers have begun to address this challenge. For example, Bormann et al. (1994a) suggest a “lacing model” of management that would integrate societal values and ecological capacity. But much more conceptual and modeling work remains to be done.

In southeast Alaska, long-term contracts with two pulp mills in the region required the Forest Service to provide large timber volumes from the Tongass National Forest. Other large-scale logging using clearcutting occurred on Native corporation land after 1980. During this time, corporations logged their most profitable timber holdings. Harvest in the region peaked at over 1 billion board feet per year in those early days of clearcutting. However, the level of production could not be sustained over time. Moreover, high levels of clearcut logging conflicted with existing subsistence and recreational use of forest resources and worked against the growth of large-scale tourism in the area. As a result, timber management in the Tongass National Forest became highly controversial. Now, the pulp mills are closed and current interest in the region focuses on smaller scale, value-added, sustainable timber management with fewer adverse effects on subsistence, recreational, and tourist uses of the forest. Selective harvesting and other alternatives to clearcutting will be part of this new approach to timber management. Examining public opinion and the social acceptability of different management regimes will be essential in developing a forest management policy that has widespread public support.

Methods

Most of the timber harvesting in the Tongass National Forest over the past 30 years has been done by using clearcut logging. In recent years, exclusive reliance on this method of timber harvesting has come into question because of its effects on other uses of the forest and on wildlife and fish habitat, and because the social acceptability of clearcutting has been waning. Forest management techniques need to be socially acceptable if they are to be implemented. Recognizing this, the Forest Service has examined different forest management regimes during the past decade in the Tongass National Forest through the alternatives-to-clearcutting project. The project has focused on measuring and evaluating the biophysical effects of different timber harvest alternatives. This bibliography contributes to that project by providing a guide to current thought on social acceptability.

Initially, a comprehensive literature search was undertaken to locate published material on socially acceptable alternatives to clearcutting and its component issues. Forest Service publications, professional journal articles, books on forest management and relevant social science issues, and conference and workshop proceedings were reviewed.

An iterative search process was used for both the Western Library Network and Forest Service databases by using keyword lists, literature cited lists from key references, and professional journal indexes. All reviewed references are annotated and followed by any keywords originally provided in the referenced document. In addition, a cumulative list of all keywords can be found at the end of this report.

Determining Social Acceptability

The social acceptability of alternative timber harvest practices is now understood to be the result of several factors including visual preferences, consideration of amenity use, evidence of ecosystem management, sustainable cost effective timber harvest, and community-based management strategies (Shindler et al., n.d.). A definition of social acceptability in forest management is provided by Brunson (1996c):

Social acceptability in forest management results from a judgment 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.

A determination of social acceptability is based on conditions, but it is a function of causes (Brunson 1993). Brunson (1993) has identified additional characteristics of socially acceptable forestry as follows:

- Conditions that arise as a result of “natural” causes are virtually always acceptable.
- Acceptability of a condition can only be questioned if there are feasible alternatives to that condition.
- In the presence of feasible alternatives, acceptability is a function of the perceived desirability, equitability, and feasibility of those alternatives.

- Acceptability is a function of the perceived risk associated with a condition or practice.
- Acceptability is judged within a geographic context.

Stankey (1996) suggests that acceptability is based on a choice of tolerance of what society accepts as environmental conditions and practices undertaken to maintain or restore conditions. Identifying socially acceptable alternatives to clearcutting involves a process of (1) identifying specific situational attributes influencing judgments; (2) determining the appropriate community of affected interests including nontraditional, nonlocal, intergenerational, and the unborn; and (3) understanding cost/benefit distribution relative to determinations of acceptability.

Determinations of social acceptability reflect technical knowledge, biophysical consequences, economic constraints, and political interests (Shindler et al., n.d.). Given the highly situational context of social acceptability determinations, Shindler et al. (n.d.) conclude that discovering socially acceptable alternative forest harvest practices may be primarily a matter of “working through” complex issues with individual communities to find durable solutions.

In southeast Alaska, socially acceptable forest management will need to reflect the scope of public interest in multiple forest uses. Area residents make extensive use of the forest for subsistence hunting and fishing and for recreation; forested lands also provide the wilderness environment that is the central attraction of the growing tourism industry in the region. Tribal governments closely scrutinize all activities occurring in traditional tribal territories. Many of the communities in the area are surrounded by national forest land, and the residents recognize that forest management influences the character and potential development of their community. Both national and local interests include a desire to maintain and enhance the area’s wildlife and fishery resources and to protect the ecosystems of the last temperate rain forest.

Assessing Public Response

The history of social science research on the acceptability of alternatives to clearcutting is relatively recent. Much of the earliest work, beginning in the 1970s and continuing through the 1980s, was concerned with visual impacts and investigations of scenic beauty. Research designed to address the issue of scenic beauty includes Arthur (1977); Axelsson-Lindgren and Sorte (1987); Becker (1983); Benson and Ullrich (1981); Benson et al. (1985); Brown and Daniel (1986); Brunson (1991); Brunson and Shelby (1992); Magill (1992); McCool et al. (1986); Ribe (1982, 1989); Williams, (n.d.); and Wood (1988). In 1974, the Forest Service developed the visual management system and the scenic beauty estimation method (Benson and Ullrich 1981) to address visual resource issues. Other researchers identified the forest visual opportunity spectrum (Axelsson-Lindgren and Sorte 1987). Forest management was aimed at achieving a visual, stylized ideal nature rather than dynamic change. Vegetative and topographic screens were used to hide or reduce visual impacts and sustain an illusion that the natural forest is mature, tidy, and unchanging. Walters (1990) developed a handbook of forest management techniques that illustrates visual quality objectives specified in national forest management plans for use in research and planning. These efforts were not without their critics. For example, Wood (1988) criticized the visual resource management system for confusing appearance with substance and substituting a scene for an ecosystem.

As it became clear that citizens wanted more than an aesthetic view of their managed forests, concerns expanded to include evaluation of recreational preferences. Forest users wanted a forest in which they could hike, camp, ski, and hunt in aesthetically pleasant surroundings. Research into perceived adequacy of recreational values in managed forests included the work of Axelsson-Lindgren and Sorte (1987); Becker (1983); Brunson (1991, 1996a); Brunson and Shelby (1992); and Levine and Langenau (1979).

Economic issues, always a factor in communities affected by forest management, have been the subject of social research over the past three decades as well. Earlier social science inquiry focused on jobs, timber products, and market economies. Maki et al. (1985) developed a dynamic simulation model for analyzing the importance of forest resources in Alaska and the consequences of alternative forest management policies on timber and tourism. Allen et al. (1998) looked at the economies of southeast Alaska in addressing the issue of timber industry economy. Recently, socioeconomic research has documented the role of subsistence economies in timber-dependent communities (Muth 1990) and the integration of market and subsistence forest resource use in mixed economies (Pinkerton 1998). Estimation of the economic value of environmental improvements and damages through variations in the contingent valuation method was proposed in Gregory et al. (1993). Several authors, including Rogers (1996), observe that attaching monetary values to non-market values is highly controversial. Iverson and Alston (1993) examine the broadening role for economics in forest management but caution against inappropriate relative valuation assessments of utilitarian and nonutilitarian forest values. Community stability is about more than local forest management policies, however, because external events such as technological change can affect community economies (Schallau 1989). Stability itself is a dynamic, not static, condition, and socially acceptable timber harvest will differ through time and space.

The aesthetic forest experience for many depends largely on a scenic aesthetic (Ribe 1999). The social acceptability of forest management is subject to effects of information and attitudes and can become complex. McBeth and Foster (1994) discovered that environmental concerns find support in rural communities when the message is consistent with rural values and concerns. Shindler et al. (1993) discovered dramatic support for ecosystem-based forest management policies that used an environmentally oriented, multiple-valued, public-influenced, holistic approach. Additional research by Steel et al. (1994) revealed support for an ecologically sensitive, holistic, multivalued, forest management approach in Oregon and national publics.

Gobster (1996) has observed that the social acceptability of ecosystem management depends on perception and meaning of the forest environment. Because appreciation of ecosystem management is an acquired cognitive attitude dependent on an understanding of dynamic environment, rather than an immediate, affective visual aesthetic like scenic value, it is unlikely that society will immediately adopt an ecological aesthetic. To aid in the transition to an ecological aesthetic, Gobster advocates the concept of "appropriateness" to bridge conflicts between aesthetic and biodiversity values in the short term and focus on the question of "what belongs where" until such time as an ecological aesthetic becomes widely held.

The acceptability of ecosystem management is subject to such factors as agency intent, scientific fallibility, and risk (Brunson 1996b). Because ecosystem management is a developing field, the Forest Service's strategy of adaptive management (learning and adjusting over time) will necessarily lead to the need for corrections and changes in forest management techniques. This in turn will affect public confidence and public acceptance of forest management decisions.

Hansis (1995) investigated the social acceptability of clearcutting in the Pacific Northwest. He concluded that social science research needs to be both quantitative and qualitative for nuanced values and contexts of social acceptability to be understood. In-depth interviews and participant observation are two research techniques recommended to help illuminate public opinion on forest management issues.

As Shindler et al. (n.d.) have indicated, the subject of acceptability is complex and must be considered in the context in which a management practice is proposed. Generalization is difficult because each situation is unique to the affected individuals, groups, communities, and cultures. However, preferences for mature forests over young ones, natural looking over managed stands, and partial cutting over clearcuts prevail.

In southeast Alaska, Shindler et al. (n.d.) have identified scenic values as important to virtually all affected interests. Timber production and associated issues of economics, harvest level, and sustainability are also of great concern. Other issues factoring into acceptability of forest practices in southeast Alaska include recreation, habitat, and watershed protection; subsistence uses; cultural resources; educational value; and existence or spiritual values.

Conclusions

Social management, including both value management and conflict management, is now recognized as one of the three elements of forest management (Kennedy and Thomas 1995). But investigation of the subject has only recently begun, and the social science needed to research socially acceptable forest management practices is undeveloped. The issue of social acceptability is complex, heavily dependent on context, and tied to specifics of time and space. It is a concept that attempts to integrate all the held values of a community in one forest management strategy. To accomplish this, an integrative approach is needed.

Zube (1987) explored the concept of landscape perception and concludes that patterns of individual land use activity differ among individuals and form the basis of an individual's landscape perception. Moreover, human-landscape interaction research is fragmentary, and a general landscape perception theory is lacking. In pursuit of an integrative approach, Thorne and Huang (1991) advocate combining issues of landscape ecological integrity with issues of aesthetic appeal to create a landscape ecological aesthetic. Wright (1992) suggests that the reductionistic methods of the scientific method cannot adequately articulate ecological knowledge that is holistic in nature. He contends that only language, not quantitative science, can effectively represent the social-natural rationality of ecosystems.

Adding further to the challenge, the concept of ecosystem management itself has come under question. As a recent and still somewhat unproven approach, ecosystem management on Forest Service lands is an evolving strategy influenced by its own

information feedback mechanism. Competing and conflicting values can further confuse the determination of socially acceptable forest management. For example, visual aesthetics can conflict with biodiversity values in a stylized ideal “tidy” nature where visually negative but biologically productive downed wood is left to decay.

Literature on the social acceptability of alternatives to clearcutting indicates that both qualitative and quantitative social science research will be required to identify socially acceptable alternatives to clearcutting in southeast Alaska. The research will need to target specific communities and interest groups and elicit their opinions about specific forest lands and specific forest practices over specified periods. It will need to inquire about process as well as effects because public opinion depends on perceptions of the decisionmaking process as well as the decision itself. It will need to investigate nonutilitarian as well as utilitarian values because aesthetic, existential, and future values affect acceptability as do the use values of timber production, recreation, ecosystem sustainability, watershed protection, fish and wildlife harvest, cultural resources, and educational opportunities. This social science research needs to be structured in such a way as to allow meaningful conclusions about the held values of a surveyed population and, where possible, offer predictive insight on the acceptability of specific forest management proposals.

Research on the subject of socially acceptable forest management practices has many parallels with natural science ecosystem research. Both examine complex subjects composed of multiple interactive variables. Initially, what is required is an understanding of the component parts. This requires basic quantifiable data collection. In forest ecosystems, this is species research; for social acceptability, it is investigation and documentation of the various held values and attitudes about acceptable forest management practices. Once a basic understanding of the variables has been reached, it is necessary to learn how these variables interact and affect each other. Social science can provide descriptive, qualitative explanations of the dynamic relation of held values and attitudes, and a model of these interactions can be constructed. This synthesis of information creates a concept of social acceptability. Social acceptability, then, is an all-encompassing concept that tries to explain a community's multitude of opinions. The task of social science is to identify the variables, reveal the relations between these variables, and present an explanation of acceptability for use in forest management.

Acknowledgments

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Annotated References

Allen, S.D.; Robertson, G.; Schaefer, J. 1998. Economies in transition: an assessment of trends relevant to management of the Tongass National Forest. Gen. Tech. Rep. PNW-GTR-417. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 101 p.

This assessment does not directly address the issue of social acceptability of alternatives to clearcutting. However, it identifies the economic issues of primary concern to southeast Alaskans that are among the factors on which social acceptability of alternatives to clearcutting is judged; thus it may be useful in designing social science research on the subject of acceptability. The abstract states the following:

This assessment focuses on the regional and community economies of southeast Alaska. A mixed economy composed of subsistence harvest and cash income characterizes the economies of most of the region's rural communities. Although the share of natural resource-based sectors relative to total employment has remained fairly consistent over the past 10 years, the mix of industries within that share is shifting, with substantial declines in the wood products sector and substantial increases in the recreation-tourism sector. Regional trends are reflected very differently across boroughs, and even more so across the many small communities of southeast Alaska; analysis at diverse scales was needed to accurately portray economic and social conditions and trends.

Keywords: Tongass National Forest, southeast Alaska, economic trends, employment, subsistence, communities.

Arthur, L.M. 1977. Predicting scenic beauty of forest environments: some empirical tests. *Forest Science*. 23: 151-159.

Demonstrates that effective prediction of scenic preferences is within the scope of available technology and measurement.

This study tests the usefulness of three landscape description techniques—scaling of physical features, inventories of visual (design) features, and timber cruises—for predicting scenic beauty of forested environments. Two criteria are used to test predictive usefulness: the effectiveness of each technique in explaining people's evaluations of the scenic beauty of forested landscapes, and the ease of using the landscape descriptions to manage for scenic beauty. . . .

Three groups of respondents—landscape architects, university students, and a general public sample—provided scenic beauty ratings of Arizona ponderosa pine landscapes, represented in color slides. Multiple regression techniques were used to relate their preferences to three quantitative descriptions of landscapes, obtained from practicing and student landscape architects and foresters. Design inventory and physical feature descriptors were then correlated with mensuration (timber cruise) descriptors. While all prediction models explained substantial portions of perceptual preferences, measures of manageable landscape features tended to show stronger relationships to mensuration parameters than did design features.

Keywords: Landscape management, scenic values, forest use.

Axelsson-Lindgren, C.; Sorte, G. 1987. Public response to differences between visually distinguishable forest stands in a recreation area. *Landscape and Urban Planning*. 14: 211-217.

This study investigated user response to visual variation in forests, which the authors refer to as the forest visual opportunity spectrum. Two trails, each 2.5 kilometers long were laid out in a forest. One trail traversed eight visually distinguishable forest stands; the other trail crossed three different forest stands. Sixteen subjects walked the two trails and then made assessments of trail length, time spent traversing the trail, visual impressions, and suitability of the trail for typical open-air recreational activities. After walking the trails, participants assessed time and distance more accurately in the more varied forest stands, and willingness to engage in recreational activities was higher in the more varied forest stands.

The questions asked by this study may be useful to pursue in addressing the aesthetic and scenic beauty elements of social acceptability of alternatives to clearcutting.

Becker, R.H. 1983. Opinions about clear-cutting and recognition of clear-cuts by forest recreation visitors. *Journal of Environmental Management*. 17: 171-177.

Analyzes forest recreation visitor opinions about clearcutting in a central broad-leaved forest in the Savage River State Forest in Grantsville, Maryland, in 1974-75. Opinions were determined through a questionnaire administered by field crew members to 249 users in summer and 192 users in fall and early winter. Forest users were sorted based on whether they knew or did not know they had encountered a clearcut. A chi-square test was then used to determine association with selected study variables. A Pearson's contingency coefficient was used to determine the strength and direction of any association. The aggregate summer visitor sample was less aware of clearcuts and more antagonistic toward clearcutting as a forest management tool than fall visitors.

Conclusions of the study determined that many forest recreation visitors who held the opinion that clearcutting was undesirable did not recognize clearcuts, principally used the forest during summer, did not live near the forest, and had an enjoyable forest recreation visit. The study concluded that the concept of clearcuts and clearcutting has little association with actual cut sites in the study area. The study further concluded that negative opinions about clearcutting could be improved through education.

Keywords: Clearcutting, forest recreation, attitudes, forest management.

Behan, R.W. 1990. Multi-resource forest management: a paradigmatic challenge to professional forestry. *Journal of Forestry*. 88(4): 12-18.

Explains the paradigmatic shift implicit in "New Forestry." The author contends that previous sustained-yield multiple-use management of national forests was a market-oriented attempt to perpetuate the physical supply of specific substances and services. Harvest of the resource was constrained by growth. Alternatively, new forestry, which the author refers to as multiresource forest management, is a land-oriented concept, not a set of techniques that seeks simultaneous production of interdependent substances and services. Maintenance of the forest system is the constraint.

According to statute, the multiple use of forest resources is supposed to be achieved simultaneously, not adjacently. Because the forest is a single, interactive system of plants, animals, soil, water, topography, and climate, simultaneous multiple use is axiomatic; it is implicit in the concept. This integrated viewpoint (“touch a flower, disturb a star”), however, is not being achieved largely as a result of professional specialization, and multiple commitments to several use constituencies are absent among Forest Service foresters. Coordinated team teaching is needed to address the forest resource system, rather than separate subsystems. Simulation models can be used to anticipate effects of management strategies.

Bengston, D.N. 1994. Changing forest values and ecosystem management. *Society and Natural Resources*. 7: 515-533.

The author contends that there is substantial evidence of a rapid change in held forest values, in types of value relations, and in relative values assigned to forest-related objects as revealed in the new environmental paradigm. The social context for forestry has changed. The dominant social paradigm, which emphasized economic growth, control of nature, faith in science and technology, enough natural resources, substitutability of resources and expert decisionmaking, is giving way to the new environmental paradigm, which features sustainable development, harmony with nature, skepticism of scientific and technological fixes, finite natural resources, limits to substitution, and public involvement in decisionmaking.

To address this change in forest values, the following questions need to be asked: (1) What is the nature of forest values? Can forest values be reduced to a single dimension or are they multidimensional and incommensurate? (2) What specific values are involved? (3) How are forest values related to other value systems? (4) How and why have forest values changed over time? (5) What do changing forest values imply for ecosystem management approaches?

Keywords: Ecosystem management, forest values, methodological pluralism, multidimensionality, new forestry.

Benson, R.E.; Ullrich, J.R. 1981. Visual impacts of forest management activities: findings on public preferences. Res. Pap. INT-262. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 14 p.

The visual impact of various timber harvest and road construction alternatives was measured by using the scenic beauty estimation method. Panels of viewers rated color slides on a zero to 9 scale of “dislike” versus “like.” Numerous case studies have shown the method gives consistent and reliable measures of viewer preferences. Rankings of different treatments were nearly identical among different viewers although they included such diverse interest groups as the wood industry and outdoor recreation management students. Study areas included several forest types and a variety of harvest and road construction situations.

In general, partial harvesting is preferred to clearcutting; the less logging debris, the higher the preference, and the less soils disturbance and more revegetation along roads, the higher the preference. The findings can be used to estimate visual impacts in planning of activities and to compare the aesthetic gains or losses from alternative practices.

Keywords: Aesthetics, landscape management, visual quality, logging, residues.

Benson, R.E.; McCool, S.F.; Schlieter, J.A. 1985. Attaining visual quality objectives in timber harvest areas—landscape architect's evaluation. Res. Note INT-348. Ogden, UT. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 8 p.

Three groups of Forest Service landscape architects rated color slides of 25 timber-harvested areas in northern Rocky Mountain national forests for attainment of visual quality objectives and based on forest conditions, topography, and type of viewing assigned a scenic beauty estimate. Consensus was that objectives were usually attained; beauty ratings generally dropped; and distinctions became more pronounced with increasing evidence of disturbance. The results support the idea of a system of visual quality objectives based on the degree of acceptable landscape modification.

Keywords: Aesthetics, landscapes, timber harvesting, visual management.

Berkes, F.; Folke, C., eds. 1998. Linking social and ecological systems: management practices and social mechanisms for building resilience. Cambridge, England: Cambridge University Press. 440 p.

Examines opportunities for improving ecosystem resilience through application of alternative social system management strategies. Although not directly addressing the issue of social acceptability of alternatives to clearcutting, it does explore the integration of social and natural systems.

Bohman, J. 1991. New philosophy of social science: problems of indeterminacy. Cambridge, MA: MIT Press. 273 p.

Presents a philosophical argument on the validity of social science in the face of complexity, subjectivity, and imperfect knowledge. It does not discuss the role of social science research in identifying socially acceptable alternatives to clearcutting.

Bonnicksen, T.M. 1991. Managing biosocial systems: a framework to organize society environment relationships. *Journal of Forestry*. 89(1): 10-15.

Explains the use of a biosocial model as a systems framework for understanding society and environment relations. This reciprocal adjustment theory is superior to preceding one-way adjustment theories (cultural determinism and environmental determinism) and a purely ecosystem model in terms of addressing the relation of industrial societies to the natural environment. The biosocial system uses interaction between a management (social) subsystem and an ecological subsystem through verbal, scenario, scenario-computer, or all-computer simulations.

Bormann, B.T.; Brookes, M.H.; Ford, E.D. [et al.]. 1994a. A framework for sustainable-ecosystem management. Gen. Tech. Rep. PNW-GTR-331. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 61 p.

Sustainable ecosystem management is defined as the overlap between what people want for themselves and future generations and what is biologically and physically possible in the long term. In this report, principles for sustainable ecosystem management are derived by integrating fundamental, societal, and scientific premises. Ecosystem science is applied in the design of a system of management focused on building overlap between what people collectively want and what is ecologically possible. The report concludes that to make better informed decisions and to learn by “managing as an experiment,” management must incorporate more science and societal processes in the system. The “lacing model” of management is proposed to integrate societal values and ecological capacity.

Keywords: Sustainability, ecosystem management, sustainable development, future generations, unexpected future options, management principles, managing as an experiment, adaptive management, information as a resource, communities of interest, diversification, iterative decisionmaking, management system, lacing model.

Bormann, B.T.; Cunningham, P.G.; Brookes, M.H.; Manning, V.W.; Collopy, M.W. 1994b. Adaptive ecosystem management in the Pacific Northwest. Gen. Tech. Rep. PNW-GTR-341. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 22 p.

A systematic approach to adaptive management is proposed for simultaneously managing federal lands in Washington, Oregon, and northern California at the regional, provincial, and watershed scales. This approach attempts to reorganize agency activities to better support the concepts of adaptive management to make better decisions, improve public participation and develop science-based management through the following adjustment (expanded decisionmaking), linked actions, feedback and monitoring, and information synthesis. Future adjustments are to be decided through a collaborative decisionmaking process, and integrated (linked) management and research efforts are designed to acquire the information needed to make proposed adjustments. Feedback and information synthesis can then inform future decisions.

Keywords: Adaptive management, feedback, adjustment, future decisions, linked actions, management experiments, information synthesis, decision support, science-based management, public participation, lacing model.

Brooks, D.J.; Grant, G.E. 1992. New approaches to forest management: background, science issues, and research agenda. *Journal of Forestry*. 90(1): 25-28; 90(2): 21-24. (2 parts).

Part one examines the scientific, management, and social factors that have contributed to the need for rethinking some basic precepts of forest management. Part two outlines a framework for research and suggests some directions and approaches to be more fully developed including the need for social science research to identify

values assigned by the public to different forest states and scenarios, and economic research on the value of forest resources in economies and communities and the social benefits of nontimber forest attributes.

Brown, G.; Harris, C.C. 1992. The U.S. Forest Service: Toward the new resource management paradigm? *Society and Natural Resources*. 5: 231-245.

The attitudes and values of Forest Service employees toward resource management issues are examined by applying general concepts and empirical observations on social change and resource sociology to the concept of a dominant and a new forestry paradigm. Results of a survey of Forest Service employees suggested that the attitudes and values of employees in the Association of Forest Service Employees for Environmental Ethics (AFSEEE) represent an alternative (new) resource management paradigm that differs significantly from the dominant management paradigm held by most Forest Service employees. The potential role of AFSEEE as an agent of change within the Forest Service is discussed relative to other changes that are occurring concurrently in the Forest Service.

Keywords: Change, Forest Service, forestry, paradigm, resource management.

Brown, T.C.; Daniel, T.C. 1986. Predicting scenic beauty of timber stands. *Forest Science*. 32(2): 471-487.

Presents the results of three studies on predicting the near-view scenic beauty of ponderosa pine timber stands in north-central Arizona. Psychophysical scenic beauty models of ponderosa pine suggest scenic beauty increases with herbage and large pine, and decreases with downed wood and unattractive tree grouping. Using both onsite evaluation and color slides, groups of typical forest visitors were asked to evaluate both site- and stand-level scenic beauty. It was determined that stand-level scenic beauty judgments correlated closely with site-level scenic beauty judgments and color slides were a good substitute for onsite evaluation. The results suggest potential for modeling the scenic beauty of conventionally delineated stands based on standard forest inventory information.

Keywords: Ponderosa pine, forest aesthetics, landscape assessment, scenic beauty.

Brunckhorst, D.J.; Rollings, N.M. 1999. Linking ecological and social functions of landscapes. *Influencing resource governance*. *Natural Areas Journal*. 19(1): 57-64.

The thesis is as follows:

Society must make a fundamental shift in the way it views and uses natural resources if it is to ensure an ecologically supportable future. Workable solutions to the sustainable use of natural resources are constrained by many institutional barriers, narrowly focused scientific research, and compartmentalized systems of natural resource management. Novel and radical approaches are needed if humanity is to find realistic solutions to social and environmental sustainability issues that the citizenry can adopt and then adapt with matching civic skills and knowledge. Consequently, future sustainability will depend on a system of

resource governance that mediates the relationship between the citizenry and the economy, on the one hand, and continuance of ecosystem functional processes, on the other.

Keywords: Government, natural resource use, resource governance, sustainability.

Brunson, M.W. 1991. Effects of traditional and “New Forestry” practices on recreational and scenic quality of managed forest. Corvallis, OR: Oregon State University. 192 p. Ph.D. dissertation.

Addresses the subject of aesthetic and recreational impacts of forest management. The author reviewed existing literature on the subject and conducted original research on timber stands in which New Forestry and traditional prescriptions were used. Judgments of scenic, hiking, and camping quality were obtained in two phases, one using onsite raters at six sites and one with raters viewing slides of 12 silvicultural treatments. Preferred stand attributes were examined, including effects of artificial snag-creation methods and the ability of information to improve acceptability of non-traditional New Forestry practices. Results were as follows:

New Forestry practices were preferred over traditional methods when judgments were made on-site but traditional methods were rated more acceptable by slide viewers. . . . Judgments of scenic quality differed slightly from those of hiking quality, and were more divergent from those of camping quality. . . . Attributes relating to the evidence of human presence were the most influential on both scenic and recreational judgments. Biodiversity also affected scenic beauty, whereas attraction places enhanced recreational quality. Artificial snag creation reduced the perceived quality of stands where a majority of trees had been harvested, but judgments improved after snag creation in stands where group selection methods were employed. Information about New Forestry had a limited mitigative effect on adverse scenic impacts of nontraditional silviculture.

A concluding section of the dissertation discusses implications of this study on management of forests where new methods are tested, and suggests directions for future research.

Brunson, M.W. 1993. “Socially acceptable” forestry: What does it imply for ecosystem management? *Western Journal of Applied Forestry*. 8(4): 1-4.

Presents findings of a study conducted by the Consortium for Social Values of Natural Resources of social acceptability. Discusses the implication of the study’s findings. A multidisciplinary, multimethod study design conducted in 1992 included a review of literature, a 3-day experts’ workshop, and field tours with surveys to develop a seven-point definition of social acceptability as follows:

- Acceptability may apply to conditions, but it is a function of causes.
- Conditions that arise as a result of “natural” causes are virtually always acceptable.
- Acceptability of a condition can only be questioned if there are feasible alternatives to that condition.

- In the presence of feasible alternatives, acceptability is a function of the perceived desirability, equitability, and feasibility of those alternatives.
- Acceptability is a function of the perceived risk associated with a condition or practice.
- Acceptability is judged within a geographic context.
- Acceptability is rarely defined rigorously—is it a norm, a preference, a desired condition, or a tolerance threshold?

Discusses the implications of using social acceptability as a forest management objective.

Brunson, M.W. 1996a. Integrating human habitat requirements into ecosystem management strategies: a case study. *Natural Areas Journal*. 16(2): 100-107.

Addresses the goal of integrating ecosystem management with socially acceptable landscapes by proposing use of a common language for the social and biological sciences. He proposes that the concept “habitat” can be applied to human uses of natural areas and proposes a prototype “habitat suitability index” for three common forest uses: hiking, camping, and scenic viewing.

Brunson, M.W. 1996b. The social context of ecosystem management: unanswered questions and unresolved issues. In: Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. *Defining social acceptability in ecosystem management: a workshop proceedings*. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 113-126.

Among the emerging problems associated with the social context of ecosystem management are questions about (1) ecosystem management as an idea, (2) its implementability, and (3) specific aspects of ecosystem management practices and conditions. This paper discusses several of these issues, including questions raised by national forest stakeholders as well as those arising from the workshop that led to this proceedings. The most fundamental 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.

Keywords: Ecosystem management, acceptability, scientific uncertainty, risk perception, biocentrism, public participation, values of knowledge.

Brunson, M.W. 1996c. A definition of “social acceptability” in ecosystem management. In: Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. *Defining social acceptability in ecosystem management: a workshop proceedings*. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 7–16.

The paper's abstract explains:

Social “acceptability” is one of three criteria that are supposed to guide ecosystem management decisions, yet a recent problem analysis found “there is an inadequate understanding of what constitutes ‘acceptability’ with regard to [ecosystem management].” Based on research undertaken in response to that analysis, this 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.

Brunson defines social acceptability in forest management as resulting

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.

Keywords: Mixed scanning approach, attitudes, behaviors, ecosystem management, social acceptability.

Brunson, M.W. 1998. Social dimensions of boundaries: balancing cooperation and self-interest. In: Knight, R.L.; Landres, P.B., eds. *Stewardship across boundaries*. Washington, DC: Island Press: 65-86.

Presents the idea that boundaries are social constructs marking human-perceived differences in nature and identity of places. Good stewards must safeguard the permeability of boundaries. Stewardship projects should acknowledge the existence of territories and follow norms of procedural justice and sharing authority. The author does not discuss the social acceptability of alternatives to clearcutting. However, some of the concepts presented in this chapter may help illuminate the issue of what makes alternatives to clearcutting socially acceptable.

Brunson, M.W.; Kennedy, J.J. 1995. Redefining “multiple-use”: agency responses to changing social values. In: Knight, R.L.; Bates, S.F., eds. *A new century for natural resource management*. Washington, DC: Island Press: 143-158.

Reviews the response of federal agencies, including the Forest Service, to changes in the relations between resources and society in the 1960s and 1970s. Fundamental changes in social values and demands have set the stage for a new management paradigm based on ecosystem management and fundamental public involvement in planning and decisionmaking processes.

Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. 1996. Defining social acceptability in ecosystem management: a workshop proceedings. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 142 p.

Includes 10 papers developed in summary of a workshop held in 1992 to discuss socially acceptable forestry in an ecosystem-based forest management framework. The papers are authored by the leading experts on the subject of socially acceptable forestry and address a variety of topics from definition of the concept to the implications of doing it and future directions of the concept's development.

Keywords: Ecosystem management, social acceptability, environmental ethics, social values, landscape aesthetics, public participation.

Brunson, M.; Shelby, B. 1992. Assessing recreational and scenic quality: How does New Forestry rate? *Journal of Forestry*. 90(7): 37-41.

Describes a pilot study of New Forestry scenic and recreational values conducted on the Oregon State University research forest in September through October 1990. Comparative judgments of recreational and scenic quality were obtained by surveying 95 persons who visited an old-growth Douglas-fir stand and five nearby stands harvested within the previous 2 years. Results produced a higher rating for New Forestry stands than for those harvested through the use of traditional practice. Recreational acceptability judgments are based on psychological, social, physical, and managerial contexts and recreational intent (e.g., hiking vs. camping). Scenic judgments supported preferences for "natural looking" stands, with old-growth stands judged most attractive and slash volume negatively related to aesthetic quality. Preliminary findings suggest silvicultural prescriptions can address both biodiversity objectives and scenic/recreational quality.

Burchfield, J.A.; Miller, J.M.; Allen, S.D.; Schroeder, R.F. 2003. Social implications of alternatives to clearcutting on the Tongass National Forest: an exploratory study of residents' responses to alternative silvicultural treatments at Hanus Bay, Alaska. Gen. Tech. Rep. PNW-GTR-575. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 28 p.

Summarizes results of a field study in southeast Alaska in which 27 respondents were asked a series of questions concerning the social acceptability of different logging levels and logging patterns. The study used data from silvicultural research conducted at Hanus Bay, Alaska. Respondents were shown pictures of different logging regimes and were told the expected effects of different logging patterns on wildlife and fish productivity, biological diversity and abundance, and timber yield and damage to trees left standing. The study found that respondents made decisions on social acceptability based on shared community values, desire to sustain lifestyles, and sense of justice or fairness. Respondents sought to balance commercial use of forest resources with other values.

Chenoweth, R.E.; Gobster, P.H. 1990. The nature and ecology of aesthetic experiences in the landscape. *Landscape Journal*. 9(1): 1-8.

Reports on the results of an empirical study of the aesthetic experience of landscape. Twenty-five college students at the University of Wisconsin in Madison in spring semesters of 1983 and 1984 were given diaries consisting of structured and open-ended response formats in which to record their aesthetic experiences. Analysis of the resulting data revealed an ecology of aesthetic experiences in time and space

that were highly valued relative to other meaningful life experiences. Implications for research in landscape assessment and management of landscapes for aesthetic experiences are discussed in the paper.

Clark, R.N.; Stankey, G.H. 1991. New Forestry or New Perspectives? The importance of asking the right questions. *Forest Perspectives*. 1(1): 9-13.

This essay on defining New Forestry and New Perspectives discusses the results of a problem analysis conducted by the Consortium for the Social Values of Natural Resources. By means of a Delphi process, 90 elements were identified in the definition of new perspectives that were grouped into six general categories as follows:

- An ecologically founded approach to forest management.
- The need for greater integration of different forest uses and values.
- The need to focus on changing public values and uses of forest resources.
- The need for different approaches to making decisions about forest management.
- Application of better management tools and improved knowledge of management consequences.
- Questioning agency and professional motives.

The results suggest that the concepts of New Perspectives and New Forestry encompass a philosophical perspective, a set of practices, and a new way of doing business and are still evolving with implications for educational institutions, forestry research programs, forest managers, and the public.

Clark, R.N.; Stankey, G.H. 1994. FEMAT's social assessment framework, key concepts and lessons learned. *Journal of Forestry*. 92(4): 32-35.

Discusses the work of the Forest Ecosystem Management Assessment Team's social assessment group, describing the framework, key concepts and lessons learned from the assessment. Key assumptions of the social assessment were that forest management is a social problem, it is part of a global problem, and solutions lie in inclusive, ongoing processes. Key concepts include perception of all forest values as social values and the importance of considering risk and the capacity of communities to accommodate risk when evaluating consequences of forest management. Lessons learned include a legacy of failures with distrust a symptom of the problems, a recognition that information on social values is inadequate, and the need for public education on forest management issues and public processes in forest management decisionmaking.

Clark, R.N.; Stankey, G.H.; Kruger, L.E. 1999. From new perspectives to ecosystem management: a social science perspective on forest management. In: Aley, J.; Burch, W.R.; Conover, B.; Field, D., eds. *Ecosystem management: adaptive strategies for natural resource organizations in the twenty-first century*. Philadelphia, PA: Taylor and Francis: 73-84.

Reviews the history of the New Perspectives program and ecosystem management within the context of evolving and changing social values. The authors review the findings from their 1991 Delphi study, which found that New Perspectives was seen as a philosophical concept, a set of specific practices and prescriptions, and as a new approach to doing business. They discuss problems associated with incorporating a social component in forest management and address the implications for management, education, and research.

Keywords: New Perspectives.

Cordell, H.K.; Caldwell, L.; Mou, S., eds. and comps. 1997. Integrating social science and ecosystem management: a national challenge. Proceedings of a conference on integrating social sciences and ecosystem management. Gen. Tech. Rep. SRS-17. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 213 p.

These proceedings include papers and panel presentations from a 1995 workshop on integrating social sciences and ecosystem management. Papers were organized into five subject categories and reflect the regional focus (USDA Forest Service, Southern Region) of the participants. The concept of social acceptability of forest management practices is not addressed per se; however, many of the component issues that are encompassed in the concept of socially acceptable forestry are examined.

Crowfoot, J.E.; Wondolleck, J.M. 1990. Environmental disputes: community involvement in conflict resolution. Washington, DC: Island Press. 278 p.

Presents an indepth look at citizen group involvement in various environmental dispute settlement processes. It does not discuss the role of social science research in identifying socially acceptable alternatives to clearcutting.

Daniels, S.E.; Walker, G.B.; Boeder, J.; Means, J.E. 1993. Managing ecosystems and social conflict. In: Jensen, M.E.; Bourgeron, P.S., tech. eds. 1994. Ecosystem management: principles and applications. Gen. Tech. Rep. PNW-GTR-318. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 327-339. Vol. 2: (Everett, R.L., assessment team leader; Eastside Forest Ecosystem Health Assessment).

Reviews some of the challenges to decisionmaking institutions presented by ecosystem management in the face of social conflict. It presents basic assumptions about social conflict and ecosystem management and discusses ways that traditional public participation techniques used by land management agencies may not be adequate. Collaborative negotiation based on integration of social and political considerations as well as biological values is presented as a potential forum for ecosystem management. A series of operational experiments, actual attempts at collaborative decision-making, is suggested as a research area of potential benefit.

Dunlap, R.E.; Catton, W.R. 1983. What environmental sociologists have in common (whether concerned with "built" or "natural" environments). *Sociological Inquiry*. 53(2/3): 113-135.

Environmental sociology, study of the relation between societal and environmental phenomena, is still a young field owing to conceptual and methodological difficulties in conducting studies. Environmental sociology emphasizes interactive reciprocal bidirectional relations with the environment. Environmental sociology differs from mainstream sociology in considering the relevance of the physical environment. This paper presents an ecological framework called the "Ecological Complex" for examining societal and environmental interactions and describing the interaction of environment, population, organization, and technology.

Eckhardt, C., comp. 1998. The human factor in ecological research: an annotated bibliography. Gen. Tech. Rep. PNW-GTR-429. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 45 p.

This annotated bibliography includes references addressing a broad spectrum of literature in the fields of culture, environmental law, public policy, environmental valuation strategies, philosophy, interdisciplinary research, landscape theory, design, and management.

Keywords: Human ecology, interdisciplinary research methods, ecosystem research, interdisciplinary bibliography, environmental policy, landscape design, landscape management.

Fiedler, C. 1992. New Forestry: concepts and applications. *Western Wildlife*. 17(4): 2-7.

Reviews the history of forest management in the United States and explains the advent of New Forestry. The author attributes dissatisfaction with clearcutting to societal changes including more urban populations, less direct dependence on commodity production, and a value shift toward aesthetic, recreational, and spiritual values. The New Forestry objective is to manage stands and landscapes to integrate commodity production, social values, and ecosystem sustainability. New Forestry may not be able to resolve the preservation versus ecosystem management versus intensive management debate about values rather than ecology.

Forest Ecosystem Management Assessment Team [FEMAT]. 1993. Forest ecosystem management: an ecological, economic and social assessment. Portland, OR: U.S. Department of Agriculture; U.S. Department of the Interior [and others]. [Irregular pagination].

Develops the concept of social acceptability in forest management based on knowledge, values (scenic, biodiversity, species survival, long-term site productivity), context of proposal (site specific), perceived risk of harvesting associated with uncertainty and imperfect knowledge, perceived agency motives, and spatial context. Also discusses acceptable versus desirable conditions and the optimum state versus minimum allowable conditions.

Gobster, P. 1996. Forest aesthetics, biodiversity, and the perceived appropriateness of forest management practices. In: Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. *Defining social acceptability in ecosystem management:*

a workshop proceedings. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 77-97.

The abstract is as follows:

The social acceptability of “ecosystem management” and related new forestry programs hinges on how people view the forest environment and what it means to them. For many, these conceptions are based on a “scenic aesthetic” that is dramatic and visual, where both human and natural changes are perceived negatively. In contrast, appreciation of biologically diverse forests created through ecosystem management practices depends on experience of the subtle, multimodal characteristics of a dynamic environment, an aesthetic attitude that is acquired and cognitive rather than immediate and affective. Society is unlikely to quickly adopt this “ecological aesthetic” as espoused by Aldo Leopold and others. However, the concept of appropriateness could serve as a short-term alternative for resolving perceived conflicts between aesthetic and biodiversity values. Unlike scenic assessments, assessments of appropriateness address the question “What belongs where?” and work to integrate aesthetic and biodiversity goals rather than to seek absolutes. This concept also ties aesthetics together with land ethics by seeking a harmonious “fit” between human activity and the natural world. Approaches are outlined that suggest how perceptions of appropriateness might be studied and used in the context of ecosystem management practices. Additional thought is given to how researchers and managers can begin to broaden ideas of forest aesthetics over the long term.

Keywords: Scenic beauty, biodiversity, ecological aesthetic, visual management practices, ecosystem management, landscape aesthetic, appropriateness, human-landscape interactions.

Gregory, R.; Lichenstein, S.; Slovic, P. 1993. Valuing environmental resources: a constructive approach. *Journal of Risk and Uncertainty*. 7: 177-197.

Examines the use of contingent valuation (CV) methods for estimating the economic value of environmental improvements and damages and argues that a principal constraint on the validity of CV methods is the imposition of unrealistic cognitive demands on respondents. Recent behavioral decision research questions environmental preferences and values for unfamiliar and complex objects as being constructed rather than revealed. The authors propose a new CV approach, based on multiattribute utility theory and decision analysis to better accommodate multidimensionality of value, minimize response refusals, and exclude irrelevancies.

Hansis, R. 1995. The social acceptability of clearcutting in the Pacific Northwest. *Human Organization*. 54(1): 95-101.

A survey of several northwest Oregon and southwest Washington populations was conducted by using mailed questionnaires and indepth interviews to determine the acceptability of clearcutting. Analysis of the responses indicated that acceptability of clearcutting differs according to underlying values, partly determined by direct economic interests. Acceptability of clearcutting is a reflection of values held and spatial

and temporal, biophysical, and historical contexts. Responses were more nuanced than the questionnaire could probe, and it was concluded that social science research needs to be both quantitative and qualitative to understand nuanced values and contexts of social acceptability.

Clearcutting may be more socially acceptable through innovative harvest patterns, improved equipment maintenance, better site cleanup, site recovery, and public education.

Keywords: Clearcutting, forest, participation, social acceptability.

Hansis, R. 1996. Social acceptability in anthropology and geography. In: Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. Defining social acceptability in ecosystem management, a workshop proceedings. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 37-47.

Synthesizes literature from anthropology and geography in its examination of values and their relation to acceptability. It goes on to provide

frameworks and examples of how anthropologists can contribute to the understanding of social acceptability. Context is shown to be an important factor in determining acceptability, particularly when considered in light of the meanings construed by the people involved.

Keywords: Values, acceptability, meanings, context, qualitative methods, emic approach.

Holgén, P.; Mattsson, L.; Li, C.Z. 2000. Recreation values of boreal forest stand types and landscapes resulting from different silviculture systems: an economic analysis. *Journal of Environmental Management*. 60: 173-180.

A contingent valuation survey was used to estimate the recreation value of stand types produced by four different silvicultural systems in Swedish boreal forests. A random sample of residents of a county containing typical boreal forests was asked their annual willingness to pay for forest recreation. They were shown four different photo series, each of which included four photos showing a forest stand at a specific phase of the rotation period (mature, newly cut/regenerated, young, and middle aged). Each series reflected a particular silvicultural system: natural regeneration using seed trees that are retained for 15 years; single tree selection where all age, height, and diameter classes are always present; artificial regeneration after clearcutting; and a shelterwood system with natural regeneration from seedlings growing under the old trees. Respondents were asked which landscape and stand resembled the one they use the most for recreation and which one they preferred for recreation.

The value estimates, expressed in Swedish crowns, were highest for the mature stand in the silvicultural system "natural regeneration using seed trees" and the lowest for the newly cut/planting phase in the "artificial regeneration after clearcutting" system. The authors demonstrate how recreation values of forested landscapes can be increased by modifying the shares of different stand types. For example, pruning

can make a young stand appear more like a middle-aged stand, or fertilizer can make a middle-aged stand more similar to a mature stand. Less than 5 percent of the regenerated forested area in Sweden is the shelterwood system, which is valued most highly for recreation.

Iverson, D.C.; Alston, R.M. 1993. Ecosystem-based forestry requires a broader economic focus. *Journal of Sustainable Forestry*. 1(2): 97-106.

Economic analysis can be used to evaluate monetized tradeoffs and identify marginal and nonmarginal changes and associated nonmonetary costs. But economists have no expertise in identifying relative valuation of utilitarian and nonutilitarian goals and should not attempt “efficiency” and net value assessments. This article discusses the broadening role for economics in national forest planning in such capacity as accounting for public expenditure but cautions against inappropriate use of such economic tools as efficiency analysis in arriving at forest plan alternatives.

Jones, R.E.; Dunlap, R.E. 1992. The social bases of environmental concern: Have they changed over time? *Rural Sociology*. 57(1): 28-47.

Using data obtained from National Opinion Research Centers General Social Surveys (1973-90), this paper tests two hypotheses concerning possible changes in the sociopolitical correlates of environmental concern. Analyses of the data refute both the “broadening base” and the “economic contingency” theories. Results indicate a stable social base for environmental concern despite fluctuating economic, political, and environmental conditions. Survey results show environmental protection receiving the most support from younger adults, the well educated, political liberals, Democrats, the urban, and those employed outside of primary industries.

Kennedy, J.J.; Thomas, J.W. 1995. Managing natural resources as social value. In: Knight, R.L.; Bates, S.F., eds. *A new century for natural resources management*. Washington, DC: Island Press: 311-321.

Addresses the issue of social acceptability in forest management and concludes that because the public, including future public, is a major stockholder of natural resources, the public must be served and, therefore, managing natural resources is, at least in part, a social science. This means that social value management and social conflict management are part of current and future forest management.

Kessler, W.B.; Salwasser, H. 1995. Natural resource agencies: transforming from within. In: Knight, R.L.; Bates, S.F., eds. *A new century for natural resources management*. Washington, DC: Island Press: 171-187.

Explains the 2-year “New Perspectives” effort launched by the Forest Service in 1990. It was not a specific program of work or prescribed management practices but rather an exercise to develop a set of principles addressing sustaining healthy ecosystems, involving people as partners, strengthening the scientific basis for management, and collaborative problem-solving.

Koch, N.E.; Kennedy, J.J. 1991. Multiple-use forestry for social values. *Ambio*. 20(7): 330-333.

Examines how forest values originate in society and are communicated to forest managers. It reviews historical changes in forest management that have evolved from a multiple-product forestry to single-use forestry to multiple-use forestry in a post-industrial service society. The increased importance of the social values of forest recreation, landscape amenity, biological diversity, cultural heritage, and environmental protection require foresters to manage forest social values as well as forest resources and therefore become conflict managers. The authors suggest a new definition of forestry to address management of forest resources to provide a mix of multiple-use social values for the public while protecting forest values and use options for future generations.

Kuentzel, W.F. 1996. Socially acceptable forestry: Mediating a compromise or orchestrating the agenda? In: Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. Defining social acceptability in ecosystem management: a workshop proceedings. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 49-63.

Natural resource policy is shaped by continuous conflict, with players characterized by different levels of power and influence. Instead of being a neutral consensus building mediator in the midst of this arena of conflict, the Forest Service tends to influence popular definitions about forest management, thereby maintaining its own power. Sociological theories, such as consensus conflict and theories of state and power, are examined as a way to understand such imbalances of power and their resultant influence on forest policy.

Keywords: Ecosystem management, resource policy, social values, stakeholders, consensus-conflict framework, social structure, public discourse.

Levine, R.L.; Langenau, E.E., Jr. 1979. Attitudes toward clearcutting and their relationships to the patterning and diversity of forest recreation activities. *Forest Science*. 25: 317-327.

As a relatively early research attempt to assess attitudes toward clearcutting, this study is perhaps most useful for its historical perspective. The study used questionnaires mailed to landowners in Michigan in 1974 and 1976 to investigate attitudes toward clearcutting as correlated to demographic variables. Attitudes were correlated by age, occupation, length of property ownership, education, and type of residence (seasonal and permanent). Findings included the fact that women landowners were less supportive of clearcutting than men and the respondents' type of recreational use of harvest areas was more predictive than demographics regarding attitudes toward clearcutting. Among the study's conclusions is the fact that experience in clearcuts results in more positive opinions of clearcuts.

Keywords: Aspen, white-tailed deer, social costs, social benefits, multivariate analysis.

List, P. 1996. Leopoldian forestry and the ethical acceptability of forest practices. In: Brunson, M.W.; Kruger, L.E.; Taylor, C.B.; Schroeder, S.A., tech. eds. Defining social acceptability in ecosystem management: a workshop proceedings. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 25-36.

The article's abstract states the following:

A wide variety of environmental and ethical frameworks exists within which foresters operate. These frequently competing systems reveal the complexity of human-environment relations. Given the disparate nature of ethical considerations facing foresters, this paper seeks to develop coherent ways to view ethical acceptability and apply them to understanding forestry issues. Four concepts in contemporary ethics are discussed, with special focus on the land ethic of Aldo Leopold and its role in substantiating ethical acceptability and shaping public opinion about environmental issues.

Keywords: Environmental ethics, multiple values, Leopoldian forestry, ecophilosophy, ethical acceptability.

Madden, R.B. 1990. The forestry challenge of the nineties: it is time foresters redefined their professional mission. *Journal of Forestry*. 88(1): 36-39.

The author contends that the needs of society have changed; foresters need to be scientists, technicians, sociologists, and politicians. The forestry profession must deal with controversy over forest land management. Economics, science, social, political, philosophical, and aesthetic values need to be taken into consideration. The author suggests that most Americans want a balance of uses in the forest.

Magill, A.W. 1992. Managed and natural landscapes: What do people like? Res. Pap. PSW-RP-213. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 28 p.

Presents research undertaken to determine visual sensitivity to managed and natural landscapes as judged by verbal responses to photography (slides). The purpose of the research was to provide managers with a better understanding of public concern over visual effects of alternative landscape management scenarios. Responses were discussed in terms of favorable and unfavorable responses and interpreted in a discussion of acceptable and unacceptable management. Questionnaire responses indicated forest stands were the most frequently reported object and were well liked. Clearcuts were disliked 30 percent more often than roads. The report concluded that a significant amount of misinterpretation of what was seen suggests a need for interpretive programs to improve public understanding of management.

Keywords: Environmental perception, landscape management, public concern, resource management, verbal responses, visual sensitivity.

Maki, W.R.; Olson, D.; Schallau, C.H. 1985. A dynamic simulation model for analyzing the importance of forest resources in Alaska. Res. Note PNW-432. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 12 p.

Presents a dynamic simulation model for examining the economic consequences in the pulp/paper and tourism industries of alternative forest resource management policies in Alaska. It is concluded that \$105 million in final demand for goods and

services in the tourism industry would compensate for employment and earnings of two pulp mills. It is suggested that the model could be adapted for use elsewhere with the use of interindustry transaction tables.

Keywords: Economic importance (forests), models, simulation, Alaska, management planning (forest).

McBeth, M.K.; Foster, R.H. 1994. Rural environmental attitudes. *Environmental Management*. 18(3): 401-411.

Examines rural environmental concerns of wealthy community newcomers and long-time rural residents. Survey data were collected from five rural Idaho communities, and responses were analyzed by gender, income, age, education, years in community, and occupation. Results provide a relatively more complex picture of rural environmental attitudes than initially assumed and indicate the cross-sectional nature of rural environmental concern. It is concluded that environmental issues will find support in rural communities provided the message is consistent with rural attitudes and values.

McCool, S.F.; Benson, R.E.; Ashor, J.L. 1986. How the public perceives the visual effects of timber harvesting: an evaluation of interest group preferences. *Environmental Management*. 10: 385-391.

Reports on a study conducted to compare how landscape architects and professional forest management groups rate 25 scenes showing five visual quality objectives in the Forest Service visual management system. Results show similar rank orderings of visual preference produced by all groups, but absolute value ratings differed among groups. Most groups were unable to differentiate scenic quality of areas of preservation from retention of visual quality objectives.

Keywords: Landscape preference, scenic values, visual resources.

Muth, R.M. 1990. Community stability as social structure: the role of subsistence uses of natural resources in southeast Alaska. In: Lee, R.G.; Field, D.R.; Burch, W.R., Jr., eds. *Community and forestry: continuities in the sociology of natural resources*. Boulder, CO: Westview Press: 211-227.

Suggests that structural sociology applied to natural resource development issues may illuminate questions of community stability. The stability of forest-dependent communities is the aim of sustained-yield harvest and other forest management policies. The author contends that subsistence resource use as a social institution has developed as a mechanism for stability in southeast Alaska. Subsistence provides a way to deal with uncertainty and the production, allocation, and consumption of scarce resources. Subsistence harvest, distribution and exchange, and consumption lend stability and social cohesion to southeast communities in the face of timber and fishing industry fluctuations. The institutional importance of subsistence in southeast Alaska is persistent, adaptable, and stable but maintenance of subsistence tradition requires resource availability, specialized (social) knowledge, and favorable harvest regulations. Forest management decisions need to be sensitive to importance of subsistence to the community.

Pinkerton, E. 1998. Integrated management of a temperate forest ecosystem through holistic forestry: a British Columbia example. In: Berkes, F.; Folke, C., eds. Linking social and ecological systems—management practices and social mechanisms for building resilience. Cambridge, NY: Cambridge University Press: 363-389.

Describes a creative response to controversial clearcutting in British Columbia. The Eagle Clan of the Gitksan people in northern British Columbia uses traditional knowledge and Western landscape ecology to develop a sustainable logging plan for a portion of their traditional territory. This smaller scale, community-based, more socially and environmentally sound approach holds the promise of more adaptive and sustainable holistic forestry for the future.

Ribe, R.G. 1982. On the possibility of quantifying scenic beauty: a response. *Landscape Planning*. 9: 61-79.

Explains and defends the empirical assessment and quantification of scenic beauty through the use of aesthetic landscape assessments. The author contends that identifying and using a variety of research methods to understand a range of qualities and relations can provide a basis for defensible and practical assessments for protecting aesthetic quality in the environment.

Ribe, R.G. 1989. The aesthetics of forestry: What has empirical preference research taught us? *Environmental Management*. 13(1): 55-74.

Addresses what is known about forest aesthetics through empirical preference research. A review of scientific research relating to public preferences for forest landscapes includes findings regarding the perception of forest conditions, scenic effects of forest treatments, and the effects of time on forest beauty and forest experience. It is concluded that forest preference prediction models show little general validity, that simple rules do not singularly or consistently determine scenic perceptions, and that an understanding of nonscenic aesthetic influences also is needed.

Although aesthetic perception research has progressed from intuitive criticism to scientific analysis, a general perceptual-aesthetic theory needs to be developed and more social science research is needed.

Ribe, R.G. 1999. Regeneration harvests versus clearcuts: public views of the acceptability and aesthetics of Northwest Forest Plan harvests. *Northwest Science*. 73 (Special issue): 102-117.

The social acceptability of forest management is complex, nuanced, and subject to effects of information and attitudes. Visual perceptions derive from reactions to aesthetics especially among less interested observers. More interested observers may form more cognitive opinions based on conceptual understanding of forest practices, ecology, etc. To date, little research has considered perceptions of New Forestry harvests or regeneration harvests prescribed by the Northwest Forest Plan. This study investigated prospects for the potential resolution of long-standing adverse perceptions of clearcut logging through these regeneration harvests as a prelude to more detailed findings from a larger social perceptions study in progress. A diverse sample of adults in western Oregon and Washington assigned ratings of acceptability

and scenic beauty to depictions of timber harvest with aggregated and dispersed patterns of approximately 15 percent green-tree retention both with and without information about their New Forestry attributes and intentions.

Respondents rated actual photographs and simulated scenes showing the two retention patterns as well as clearcuts and uncut forests shown in the same scenes. Comparisons of the average ratings suggest that 15 percent dispersed green-tree retention harvests can be perceived much the same as clearcuts, and aggregated green-tree retention patterns within harvests may produce more favorable perceptions of scenic beauty.

Rogers, K. 1996. The public, the forest, and the U.S. Forest Service: understanding attitudes towards ecosystem management. In: Brunson, M.W; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. Defining social acceptability in ecosystem management: a workshop proceedings. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 65-76.

The abstract is as follows:

An examination of past attitudes towards forests and forestry reveals the complexity and depth of emotive valuation that is a part of American political culture. This evaluation of forests can be seen in today's highly emotional public debate. With the historical perspective established, a discussion of some methods that have been used to determine how the public values the nonuse or intrinsic qualities of various elements in nature is useful and appropriate. Finally, a discussion is undertaken of methodologies and instruments that might be used to conduct a formal assessment of public attitudes toward ecosystem management practices. With this information, public resource managers will be better prepared to (1) determine the acceptability of ecosystem management practices to American Society, (2) develop appropriate public education and awareness programs, (3) improve overall communications among interested and involved parties, (4) gather more input into their own decision making process, and 5) anticipate whatever public response may greet their management decisions.

Keywords: Ecosystem management, public attitudes, values, contingent valuation, historical attitudes, acceptability.

Salwasser, H. 1990. Gaining perspective: forestry for the future. *Journal of Forestry*. 88(11): 32-38.

A 1990 presentation to the Society of American Foresters by the Forest Service director of the New Perspectives program. It represents an early exploration of the initiative for ecosystem management and calls for broadening the concept of multiple use to include multiple values.

Sample, V.A. 1991. Land stewardship in the next era of conservation. Milford, PA: Grey Towers Press. 43 p.

Presents and discusses the Grey Towers Protocol, which was developed by 30 professionals in a workshop conducted by the Pinchot Institute for Conservation in 1990. It includes four guiding land stewardship conservation principles for resource managers.

1. Management activities must be within the physical and biological capabilities of the land, based on comprehensive, up-to-date resource information and a thorough scientific understanding of the ecosystem's functioning and response.
2. The intent of management, as well as monitoring and reporting, should be making progress toward desired future resource conditions, not on achieving specific near-term resource output targets.
3. Stewardship means passing the land and resources—including intact, functioning forest ecosystems—to the next generation in better condition than they were found.
4. Land stewardship must be more than good "scientific management"; it must be a moral imperative.

Schallau, C.H. 1989. Sustained yield versus community stability. *Journal of Forestry*. 87(9): 16-23.

Presents a case study of the community of Shelton, Washington, and the Sustained Yield Forest Management Act, which was intended to ensure community stability by ensuring that timber from national and private forest lands remains at stable levels and thus provides for a stable timber community. The case study concluded that national forests must address socioeconomic consequences of timber harvesting when addressing community stability. Because communities do not exist in isolation from the larger socioeconomic forces around them, sustained yield alone cannot ensure community stability. For example, technological change can erode jobs, requiring new export-producing employment or other initiatives to sustain the workforce. Community stability should imply orderly change, not a static fixed condition.

Shindler, B. 1995. Timber harvesting on the Tongass: What's important to local citizens? Challenges facing resource management and research. No. 11. Seattle, WA: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 3 p.

Reports on research conducted on the Tongass National Forest on opinions in the Stikine area about alternative harvesting and underlying concerns by using focus groups, individual interviews, questions, and photographs. Conclusions include the fact that social acceptability is more than a visual aesthetic; it is complex and depends on the ability of individuals to visualize and understand the effects, believe the information presented, have meaningful participation in the decisionmaking process, and recognize local benefits. Response to the study indicated concern for impacts on scenic quality, subsistence, recreation, tourism, and risks associated with proposed timber harvest. In general, the multiple-objective middle ground is the most preferred alternative. Whereas industry-associated respondents wanted to maintain timber harvest volume, citizens generally opposed highgrading, felt small is better, did not want to increase the timber harvest land base, and supported alternative methods if the rationale, research questions, and outcomes were understood.

Shindler, B.; List, P.; Steel, B.S. 1993. Managing federal forests: public attitudes in Oregon and nationwide. *Journal of Forestry*. 91(7): 36-42.

Reviews research to assess public preferences for federal forest policy and opinions on public involvement in decisionmaking. Questionnaires were mailed to a random sample of Oregon and national publics in fall 1991. Analysis of the responses showed dramatic support for ecosystem-based policies. Most approved of managing multiple values and did not support commodity-based policies. Near majorities favored a holistic approach with balance between environmental and economic components. Survey results demonstrate broad support for a more environmentally oriented, multiple valued, publicly influenced approach to federal forest management. It was concluded that noncommodity forest values need to be more significantly incorporated into federal forest management.

Shindler, B.; Peters, J.; Kruger, L. [N.d.]. Social values and acceptability of alternative harvest practices on the Tongass National Forest. 97 p. On file at: Juneau Forestry Sciences Laboratory, Library, 2770 Sherwood Lane, Juneau, Alaska, 99801-8545.

Presents an exploratory study of social values and acceptability of alternative forest harvesting practices in the Stikine Area of the Tongass National Forest. The study examines public preferences for forest management practices and suggests ways in which knowledge of local publics can be used as a forest management tool. Research objectives included examination of how people use the forest, opinions on alternative harvest practices, underlying meanings, interest group preferences, and social assessment techniques. Focus groups and personal interview techniques were used to collect qualitative data for insights, perceptions, and explanations for this exploratory research.

Results of the study support the understanding that social acceptability of alternative harvest practices is based on many factors, not any single factor, including visual preferences, amenity use, ecosystem management, sustainable cost-effective timber harvest, and community-based management. Social acceptability reflects technical knowledge, biophysical consequences, economic constraints, and political interests. Discovering socially acceptable alternative forest harvest practices may be primarily a matter of "working through" complex issues with communities to find durable solutions.

Stankey, G.H. 1996. Defining the social acceptability of forest management practices and conditions: integrating science and social choice. In: Brunson, M.W.; Kruger, L.E.; Tyler, C.B.; Schroeder, S.A., tech. eds. *Defining social acceptability in ecosystem management: a workshop proceedings*. Gen. Tech. Rep. PNW-GTR-369. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 99-111.

The abstract is as follows:

At the 1993 Forest Conference in Portland, Oregon, Ted Strong, representing Native American interests remarked, "We must understand that status quo management is completely unacceptable." His remark embraces the central feature

of the forest management crisis facing the Pacific Northwest as well as elsewhere: the current situation, characterized by uncertainty, acrimony, and distrust, leaves few, if any satisfied. And it implies the need for a search for an alternative that is characterized as “acceptable.”

What is there about the current situation that makes it unacceptable? To whom? What would characterize an acceptable alternative? Is an acceptable alternative one that is supported by a majority; if so, what is the relationship between such a judgment and long-term ecological sustainability?

Such questions are central to defining an acceptable forest management program. In this paper I first focus on the acceptability concept and its underlying rationale and role in forest management. I then turn to a framework proposed by sociologist Walter Firey defining the relationship between social acceptability and other decision factors. I conclude by outlining four basic questions that require attention if the potential of the acceptability concept is to be fulfilled.

Keywords: Social values, acceptability, decisionmaking, informed discourse, role of knowledge, cultural adaptability.

Stankey, G.H.; Brown, P.J.; Clark, R.N. 1992. Allocating and managing for diverse values of forests: the market place and beyond. In: Koch, N., comp. Integrated sustainable multiple-use forest management under the market system: Proceedings of an International Union of Forest Research Organizations (IUFRO) international conference; Pushkino, Moscow Region, Russia: 257-271.

Discusses evolution of the new paradigm and the role of values in the new paradigm. It is concluded that the new paradigm represents a broadened concept of sustainability including human as well as biological and ecological considerations, a decision-making process that includes the full community of interests, and improved public information process. The paper identifies needs for research on social values of forestry and improved integrative research strategies.

Stankey, G.H.; Clark, R.N. 1992. Social aspects of new perspectives in forestry. Milford, PA: Grey Towers Press. 33 p.

Through several assessment initiatives to outline the nature of forest values and develop a social values problem analysis, forest values identified are commodity, amenity, environmental quality, ecological, public use, and spiritual. Six general problems were defined, and many approaches to solving them were identified. The meaning and value of forests change over time and space. There is a need to better understand specific attributes that contribute to acceptability and changes in perception in time and space. Public preferences relating to forest practices as well as forest conditions need to be better researched. Methods for measuring public acceptability need to be improved. To achieve these aims, an adaptive, collaborative, multiorganizational, interdisciplinary approach is needed.

Stankey, G.H.; Cole, D.; Lucas, R.; Petersen, M.; Frissell, S. 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.

Presents a framework for establishing an effective recreation management program by identifying acceptable and appropriate resource and social conditions in recreation settings. The authors call this framework the limits of acceptable change (LAC) system. The LAC is a reformulation of the recreational carrying capacity concept with focus on desired conditions. The LAC system identifies a nine-step process to follow in developing an effective recreation management program. This general technical report is an often-referenced resource in the developing field of social acceptability management.

Steel, B.; List, P.; Shindler, B. 1994. Conflicting values about federal forests: a comparison of national and Oregon publics. *Society and Natural Resources*. 7(2): 137-153.

Presents research conducted to identify changing value orientations toward forests and to determine forest management preferences of Oregon and national publics. The paper compares the results between the two groups. Findings include the fact that both Oregon and national publics were more biocentric than anthropocentric, and the national public was more biocentric than the Oregon public. Response suggests a growing resistance to clearcutting and support for an ecologically sensitive, holistic, multivalued forest management approach. Variation in value orientation to the forest was positively correlated to sociodemographic characteristics, self and group interest, sociopolitical value orientations, and geographic location.

Keywords: Anthropocentric orientations, biocentric orientations, environmental values, federal forest, forest management, public opinion.

Super, G.; Bacon, W.; Carr, D. [et al.]. 1993. The human dimensions of national forest ecosystem management: an issue paper. In: Lund, H.G., ed. *Proceedings of the national workshop on integrated ecological and resource inventories*. Washington, DC: U.S. Department of Agriculture, Forest Service: [Pages unknown].

Reviews the concept of ecosystem management in the Forest Service and discusses human dimension data. Because of its broad scope, this presentation is necessarily general in its discussion. Human dimension inventory and analysis content and methods are explained. Conclusions are presented about management and research needs, which will be required before the human dimension receives full consideration in ecosystem management.

Thorne, J.F.; Huang, C.S. 1991. Toward a landscape ecological aesthetic: methodologies for designers and planners. *Landscape and Urban Planning*. 21: 61-79.

Advocates combining issues of landscape ecological integrity with issues of aesthetic appeal to create the landscape ecological aesthetic, which is defined as the overall health of the landscape measured in terms of air quality, availability of high-quality water from minimally disrupted hydrologic cycles, the conservation of soils, the preservation of minimally disrupted plant and animal habitat configurations, and self-motivated cultural continuity. Although no simple formula for aesthetic value can be found, aesthetic appeal is the result of sensory (vision, hearing, smell, touch, taste), symbolic, and positive feeling (emotion), and ecological integrity is based on the physical environment, and biological and cultural diversity and continuity. The

potential is explored for fusion of landscape ecology methods and their emphasis on spatial and temporal effects with aesthetic considerations' appeal to sense and sensibilities to achieve a landscape ecological aesthetic.

Voth, D.E.; Fendley, K.; Farmer, F.L. 1994. A diagnosis of the Forest Service's "social context." *Journal of Forestry*. 92(9): 17-20.

Addresses the Forest Service's New Perspectives/Ecosystem Management initiative recognition that the desired future condition of the forest is to have three components: (1) forest as a provider, (2) forest as ecosystem, and (3) forest with social context; to date, the forest's social context has not received serious attention. The authors conclude that the Forest Service needs to incorporate the public into the decisionmaking process to a greater extent and more research is needed on public participation. It is recommended that the Forest Service's extensive experience in public involvement should be analyzed as a starting point.

Walters, R., ed. 1990. Visual quality objectives in Douglas-fir forests. R6-REC-TP-016-90. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. [Pages unknown].

Illustrates visual quality objectives specified in national forest management plans with photographs and an information profile for each photograph. It is intended to be used as a tool for communicating forest management techniques and their visual conditions among planners, managers, and the public.

Wenner, L.N. 1987. The practice and promise of social science in the U.S. Forest Service. In: Miller, M.L.; Gale, R.P.; Brown, P.J., eds. *Social science in natural resource management systems*. Boulder, CO: Westview Press: 63-81.

Examines the role of applied social science in public participation, social impact analysis, and coordination of social impact analysis in management of Forest Service lands. It concludes that the current role of social science in the Forest Service is limited, constrained by inadequate staffing, tentative guidance, uncertain responsibility, controversy and complexity, low-priority status, and other institutional limitations. The author concludes with a call for increased effective use of social science analysis in the Forest Service to identify affected populations, determine agency impacts, and develop mitigation for unwanted effects.

Williams, G.W. [N.d.]. Social science research in the Forest Service: an increasing emphasis. Durham, NC: Forest History Society; U.S. Department of Agriculture, Forest Service. [Pages unknown].

Reviews the history of social science research in the Forest Service. Social science research is the scientific investigation of the physical, biological, sociological, psychological, cultural, and economic aspects of communities and individuals in relation to the use and appreciation of natural resources. Recent sociological research on forest valuation indicates public values are shifting, moving away from economic and toward aesthetic definitions. These studies also reveal differing perspectives between foresters and environmentalists, with the general public holding yet another view. The social-human aspects of ecosystem management promise to prove as complex as

the physical-biological ecosystem interactions themselves. Ecosystem management intends social science research to be integrated into management decisions, but there is currently a lack of effective leadership and coordination for social science research in the Forest Service and ambiguity regarding social science basic theory, policy development, and decisionmaking.

Wondolleck, J. 1988. Public lands conflict and resolution: managing national forest disputes. New York: Plenum Press. 263 p.

Explains the issue of public land management conflict, its historical context within the U.S. Forest Service, and proposes steps and processes to resolve land management disputes over Forest Service land. The author does not address the role of social science research in identifying socially acceptable alternatives to clearcutting.

Wood, D. 1988. Unnatural illusions: some words about visual resource management. *Landscape Journal*. 7(2): 192-205.

Critiques the visual resource management system used by federal agencies to manage landscape values. The author argues that visual resource management confuses appearance with substance and attempts to produce a "Garden of Eden" illusion while enjoying continuous increases in forest products, goods, and services. A scene is not an ecosystem, and nature cannot be managed without becoming artificial and unnatural.

Wright, W. 1992. Wild knowledge: science, language, and social life in a fragile environment. Minneapolis, MN: University of Minnesota Press. 236 p.

The author contends that science can validate only technological, not ecological, knowledge. Only language can effectively articulate knowledge of the social-natural rationality embodied in ecosystems. This is to say that knowledge of wild (nature) is holistic, not reductionist. The book does not discuss the role of social science research in identifying socially acceptable alternatives to clearcutting. However, the author's arguments may provide insight into useful approaches of inquiry and analysis of the subject of social acceptability.

Zube, E.H. 1987. Perceived land use patterns and landscape values. *Landscape Ecology*. 1(1): 37-45.

Addresses the implications of individuals' patterns of use of the land and their landscape values, and land management decisions. A transactional model of the relation between humans and landscapes is presented and applied to findings from three studies conducted in Arizona over an 8-year period. Conclusions include the suggestion that patterns of an individual's land use activity form the basis of that individual's landscape perceptions, and perceptions differ among individuals. Furthermore, perceptions, influenced by personal utility function (needs and desires) and social and cultural context define value orientation and ultimately landscape response. Finally, land use changes consonant with personal utility functions and values are supported.

Zube, E.H.; Sell, J.L.; Taylor, J.G. 1982. Landscape perception: research, application, and theory. *Landscape Planning*. 9: 1-33.

Analyzes perceived landscape values and landscape perception paradigms. Over 160 articles from 20 journals published between 1965 and 1980 are reviewed, and four paradigms (expert, psychophysical, cognitive, and experiential) are identified with discussion of their contribution to landscape planning and management and a general theory of landscape perception. It is concluded that human-landscape interaction research is fragmentary, and a general landscape perception theory needs to be developed. A proposed framework based on an interactive perception process is presented.

Bibliographic Search Terms

acceptability
adaptive management
adjustment
aesthetics
Alaska
anthropocentric orientations
appropriateness
attitudes
behaviors
biocentric orientations
biocentrism
biodiversity
change
clearcutting
communities
communities of interest
consensus-conflict framework
context
contingent valuation
cultural adaptability
decisionmaking
decision support
diversification
ecological aesthetic
economic importance (forests)
economic trends
ecophilosophy
ecosystem management
ecosystem research
emic approach
employment
environmental ethics
environmental perception
environmental policy
environmental values
ethical acceptability
federal forest
feedback
forest
forest aesthetics
forest management

forest recreation
Forest Service
forest use
forest values
forestry
future decisions
future generations
government
historical attitudes
human ecology
human-landscape interactions
information as a resource
information synthesis
informed discourse
interdisciplinary bibliography
interdisciplinary research methods
iterative decisionmaking
landscape aesthetics
landscape assessment
landscape design
landscape management
landscape preference
landscapes
Leopoldian forestry
linked actions
logging
management experiments
management planning (forest)
management principles
management system
managing as an experiment
meanings
methodological pluralism
mixed scanning approach
models
multidimensionality
multiple values
multivariate analysis
natural resource use
new forestry
new perspectives
paradigm
participation
ponderosa pine
public attitudes
public concern
public discourse
public opinion
public participation
qualitative methods

residues
resource governance
resource management
resource policy
risk perception
role of knowledge
scenic beauty
scenic values
science-based management
scientific uncertainty
simulation
social acceptability
social benefits
social costs
social structure
social values
southeast Alaska
stakeholders
subsistence
sustainability
sustainable development
(the) lacing model
timber harvesting
Tongass National Forest
unexpected future options
values
values of knowledge
verbal responses
visual management
visual management practices
visual quality
visual resources
visual sensitivity
white-tailed deer

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