

Shifting Public Values for Forest Management: Making Sense of Wicked Problems

Bruce Shindler, *Department of Forest Resources*, and **Lori A. Cramer**, *Department of Sociology, Oregon State University, Corvallis, OR 97331*.

ABSTRACT: *Wicked problems typify many of the natural resource debates in the United States and certainly describe the management of forestlands in the Pacific Northwest. Wicked problems are interrelated ones of organized complexity that cannot be solved in isolation from one another, but also hinge on differing sociopolitical values that clash in the political arena. Forestry professionals frequently find themselves caught up in the dilemma of making decisions in this era of social change and much scrutiny. This paper examines what shifting social values mean for forest management and research by (1) providing a conceptual context for forest policy decisions, (2) examining relevant problems facing management and research institutions, and (3) characterizing the implication for public forest management given the nature of wicked problems. West. J. Appl. For. 14(1):28-34.*

Some of the most controversial and politicized environmental debates in the United States today concern the appropriate management of natural resources. This is the case on public forests in the Pacific Northwest where, historically, resource extraction has been the end result of most natural resource policy and management decisions, regardless of multiple-use objectives. Concern for other values (e.g., wildlife, fish, wilderness, recreation), however, re-emerged during the 1960s and has served to broaden the scope of current forest management. The renewed emphasis on multiple-use priorities has resulted in a variety of economic, ecological, and political debates over what constitutes sustainable forest practices. At the heart of these debates are differing value orientations (and priorities) for the environment and about human relationships to natural systems (Dunlap 1992). Conflicts that result from these value clashes are among the most intractable problems facing natural resource decision-makers.

Value conflicts are not limited to management of public lands. Disagreement over forest practices has prompted the environmental community to foster ballot initiatives in California (Davis et al. 1991) and in Oregon (Forest Conservation Council 1992) calling for timber practice reform on private lands. Reflecting widespread public concerns, forest practices acts in both states have been substantially altered in recent years, with provisions for increased protection of wildlife habitat, additional scenic buffers along state high-

ways, and stricter riparian zone requirements. Currently, no debate may be more contentious than the one over endangered species and how the Endangered Species Act affects private landowners.

Natural resource managers and citizens alike are constantly evaluating decisions about their environment, "but they do not decide simply on some objective basis of right and wrong, safe and unsafe. Instead, decisions on environmental use are reached in a social context: they are influenced by such factors as cultural values and attitudes toward the environment, social class, and our relationship to others" (Cable and Cable 1995, p. 5). Although individual values and attitudes shape the issues people see as important, the theory of reasoned action suggests that behaviors are also influenced by more subjective societal norms and social pressures (see Ajzen and Fishbein 1980).

Over time, numerous social researchers have examined changes in the value structures associated with natural resource management (e.g., Cramer 1997, Steel et al. 1994, Fishbein and Manfredi 1992.). Bengston (1994) summarized the usefulness of this inquiry by asserting that managers, policy makers, and scientists can benefit from a better understanding of public values for forests in several ways: establishing appropriate goals for ecosystem management by shedding light on normative and ethical questions, predicting how people will react to proposed forest practices, and dealing with inevitable conflicts over public forest management.

It is difficult to disagree with Bengston's findings, and his thesis that those operating in the public policy arena need a broader awareness of the diverse and multidimensional values associated with forests is supportable. Indeed, identify-

NOTE: Bruce Shindler is the corresponding author and can be reached at (541) 737-3299; Fax: (541) 737-3049; E-mail: shindleb@ccmail.orst.edu. Initial research for this paper was done for the Sustainable Forestry Partnership Workshop: Forests and Society—Implementing Sustainability, Oregon State University, December 5-6, 1997.

ing people's values about forest resources is important in that it informs the policy process. We believe, however, that merely possessing this knowledge does not adequately provide solutions to the complex problems facing decision-makers today. Too often, different social values for forest resources mean fundamental differences in world view and, as we have seen most recently, the clash of values clearly plays out in the political arena (FEMAT 1993, Salvage Rider Act 1995). When politics is the forum for choosing among values, we must go beyond simple identification of values to improving our capacity to sort through complexity and uncertainty.

In illustration, several scientists described the nature of this dilemma by characterizing it as a "system of problems" problem. Ackoff (1974) acknowledged that we are increasingly faced with clusters of interrelated or interdependent problems of "organized complexity." Such situations, which cannot be solved in relative isolation from one another, form what Ackoff termed *messes*. Today, we sort out a mess through systems methods, that is, by focusing on related processes and interdisciplinary approaches. Rather than breaking things down into parts and fixing individual components, we examine interactions among the parts (King 1993).

Rittel and Webber (1973) recognized a more pervasive nature of values problems:

Diverse values are held by different groups of individuals—that what satisfies one may be abhorrent to another, that what comprises problem-solution for one is a problem-generation for another. Under such circumstances, and in the absence of overriding social theory or overriding social ethic, there is no determining which group is right and which should have its ends served.

Rittel and Webber (1973) called such situations *wicked problems* (many forest professionals were introduced to the term *wicked problems* in a provocative 1986 *Journal of Forestry* article by Allen and Gould who borrowed the phrase from the systems analysis research of Rittel and Webber). Wicked problems result when the boundaries of messes expand to include sociopolitical and moral-spiritual issues (King 1993). These become the kind of problems for which there are no "solutions." In short, strategies for dealing with messes may be relatively straightforward when values are shared; however, wicked problems require a re-examination of management approaches that may push resource professionals beyond traditional problem-solving strategies and even beyond their personal comfort zones.

Messes and wicked problems seem to describe much of the forestry debate in the Pacific Northwest. Our assertion in this discussion is that understanding public values is just the beginning in sorting out the forest policy dilemma. We will need to go beyond this first step to examine what differing social values mean for implementing forest sustainability over the long term. The purpose of this paper is threefold: (1) to provide a conceptual context for forest management decisions grounded in an understanding of shifting social values, especially those associated with forest value formation; (2) to examine problems confronting our management and research institutions as they attempt to address recent shifts in

forest values; and (3) to discuss the implications for public forest management, given the nature of messes and wicked problems.

Changing Social Values

In the decades following World War II, a number of fundamental changes transpired in advanced industrial nations, especially those identified as the "western democracies" (Dalton 1988). The basic structures of industrial societies were altered, largely by economic growth in the 1950s and 1960s, and social commentators noted a new stage of socio-economic development they labeled "postindustrial" (Rosenau 1992). Many studies have examined the social, economic, and political implications of postindustrialism (e.g., Bell 1973, Touraine 1971, Steel et al. 1992). Postindustrial societies are characterized by a number of traits, including economic dominance of the service sector over manufacturing and agriculture, complex nationwide communication networks, a high degree of economic activity based on an educated workforce that employs scientific knowledge and technology, a high level of public mobilization (including the rise of new social causes such as the environmental movement), increasing population growth and employment in urban areas, and historically unprecedented societal affluence (e.g., Inglehart 1977, Galston 1992).

It has also been argued that the advent of postindustrial society has altered individual value structures among citizens, such that "higher order" needs (e.g., quality of life) have begun to supplant more fundamental subsistence needs as the motivation for societal behavior (Yankelovich 1981, Flanagan 1982, Inglehart 1991). These changes are often manifested in personal attitudes related to natural resources and the environment (e.g., Lovrich and Pierce 1986, Steger et al. 1989). For example, Whitelaw (1992) asserted that in Oregon, it is the unique environmental assets and favorable living conditions—not available timber—that attract well-educated, well-trained personnel and advanced industrial firms to the region and ultimately drive the state's growing economy.

Shifting value orientations and priorities have resulted in two conflicting management paradigms concerning natural resources. These paradigms and the societal shifts associated with them have been well articulated by Brown and Harris (1992) and Bengston (1994), as well as others. The two competing natural resource paradigms—derived from the ideas of Gifford Pinchot and Aldo Leopold, respectively—have been labeled the "Dominant Resource Management Paradigm" and the postmodern, "New Resource Management Paradigm" (Table 1). The former view advocates the utilitarian belief that natural resource management ought to be directed toward the production of goods and services beneficial to humans, whereas the latter takes a relatively biocentric view that reflects a more environmentally holistic way of thinking about resources. In terms of implementation, the postmodern paradigm questions the wisdom of top-down decision making (Shindler et al. 1996). More directly, many who identify with this paradigm simply do not trust forest management or research experts—especially those who work for the government (Steel et al. 1992).

This shift in environmental values has been documented in the United States, Canada (Shindler et al. 1993, Dunlap 1992, Robinson et al. 1997), and other postindustrial nations worldwide (Dunlap et al. 1993, Caldwell 1991, McAllister 1991). Documentation of a shift is much less convincing for developing countries. Some policy analysts assert that attitudes toward natural resources in these settings are largely determined by the economic value derived from them (Miller 1992); however, opinion researchers reported in the *Health of the Planet Survey* (Dunlap et al. 1993) that citizens of developing nations are just as likely to support environmental protection (over economic growth) as are industrialized countries. Most notable among these are the Pacific Rim countries of Mexico, Chile, and Russia, which influence forest policy decisions here in the Pacific Northwest. Political actions, such as the proportion of lands allocated to national parks and preserves, also indicate that simple economic explanation is insufficient to predict environmental attitudes in the developing world. For example, Brechin and Kempton (1994) argued that the proliferation in developing countries of grassroots environmental organizations that more directly observe ecological degradation, or witness first-hand corporate control of natural resources and other environmental justice concerns, helps account for shifting values across cultures.

Identifiable Characteristics and Preferences

In the United States, empirical research indicates that a number of socioeconomic factors have been identified with the New Resource Management Paradigm. Population characteristics associated with postindustrial values include more highly educated individuals (e.g., Steel et al. 1990), younger people born into a postindustrial society (e.g., Blaikie 1992), female gender (e.g., Steel et al. 1994), urban residents (e.g., Shindler et al. 1996), those who work outside the resource extraction sector (e.g., Brunson et al. 1997), and those with a liberal political orientation (e.g., Jones and Dunlap 1992). No clear association exists for other factors such as income, race, or region of residence (i.e., East vs. West).

Shifting value positions and preferences among citizens are also associated with the New Resource Management Paradigm. For example, these shifts include changes in

public confidence, including a loss of confidence in federal land management agencies to allocate resources and provide effective leadership (e.g., Shindler et al. 1996). Interest in citizen involvement in policy decisions has increased (e.g., Wondolleck and Yaffee 1994, Shindler et al. 1993) often driven by an increasing lack of trust in bureaucracies in general (Knopp and Caldbeck 1990) and distrust of federal forest managers specifically (e.g., Shindler et al. 1996). In addition, Milbrath (1984) identified a greater level of public concern for avoiding environmental risk as well as a desire for new political and institutional structures. Also as part of this shift, Dunlap and Mertig (1991) found that most people now favor environmental protection over economic growth, although the majority feels this trade-off does not need to be made. Finally, grassroots support is mobilizing for more decentralized approaches to governance. A preference for more community-based control comes from the often held view that local resource professionals and politicians are more trustworthy than are national bureaucrats.

In the future, natural resource policy considerations will be determined by how well important political and social institutions (i.e., state and federal land management agencies and constituent groups interested in commodities and services from public lands) respond to these shifts in values and the potential consequences. Although social researchers have adequately described the shift in public environmental values and attitudes toward resource management, this information has not necessarily resulted in solutions for the nation's (or region's) large-scale debate over forest management. Thus far, the investigation into social values has been largely descriptive; that is, studies have examined citizens' attitudes, perceptions, and preferences. In doing so, we typically have asked people about what they want rather than engaging them in specific judgments about today's tough choices. As a result, our policy systems, which are supposed to be inclusive of public values, have not been very successful in using information about environmental values to evaluate conditions and make decisions about difficult trade-offs.

Management and Research Institutions

In recent years, researchers have also noted a number of institutional barriers to accomplishing environmental man-

Table 1. Contrasting natural resource paradigms.

Dominant resource management paradigm	New resource management paradigm
Amenities are coincidental to commodity production	Amenity outputs have primary importance
Nature to produce goods and services (anthropocentric perspective)	Nature for its own sake (biocentric perspective)
Commodity outputs over environmental protection	Environmental protection over commodity outputs
Primary concern for current generation (short-term)	Primary concern for current and future generations (long-term)
Intensive forest management such as clearcutting, herbicides, slash burning	Less intensive forest management such as "new forestry" and selective harvesting
No resource shortages—emphasis on short-term production and consumption	Limits to resource growth, emphasis on conservation for long term
Decision-making by experts	Consultative/participative decision-making
Centralized/hierarchical decision authority	Decentralized decision authority

SOURCE: Adapted from Brown and Harris. 1992. The U.S. Forest Service: Toward the new resource management paradigm? *Soc. Natur. Resour.* 5:231-245.

agement goals (e.g., Meidinger 1997, Cortner et al. 1996). Several descriptive examples largely depict our existing institutions as continuing to function under the Dominant Natural Resource Management Paradigm. That is, we still operate in an era in which agencies maintain a boundary mentality (jurisdictional lines of authority), manage for commodity outputs at the expense of other forest values (timber values are easiest to quantify), make decisions without public consultation (still a debatable concept), and continue intensive management practices that are slow to integrate social and biophysical components of ecosystems (alternatives to clearcutting are difficult to agree on). In sum, these actions reflect institutions that are inadequately equipped to engage in today's natural resource policy debate and achieve meaningful, publicly supported solutions.

Although the above may help describe the track record of our federal resource agencies, it does little to convey the growing pains of organizations in flux. Not only does the public exhibit values, so do institutions and organizations. Although public attitudes have evolved to encompass an increasingly biocentric philosophy, organizational value systems—because of their complex bureaucratic nature—have been slower to change. At a time when agency policy statements clearly call for ecosystem-based management that represents diverse values (Robertson 1991, Salwasser 1993), it is debatable whether agency actions adequately reflect such direction (Cramer 1997). For example, many agency personnel, regardless of their personal views, continue to respond to traditional organizational rewards based on measures like getting the cut out and meeting timber targets.

Yet, the personal value orientations of individual employees are important elements in understanding how organizations function and evolve (Cramer et al. 1993). As resource professionals, employees are expected to be rational in their decision-making, thereby minimizing the role of values—either personal or organizational (Simon 1956). Vining and Ebreo (1991, p. 180) noted however, “the idea that managers (or anyone else) can make decisions impartially is questionable because they may be partial primarily to their own values.” This dissonance between personal and organizational values, coupled with agency mandates, contributes to the inertia exhibited by many of our institutions today.

There is recent evidence that institutional reliance on the Dominant Resource Management Paradigm is shifting (Bullis and Kennedy, 1991). In large measure, employee demographics are changing the face of our resource management agencies (Decker et al. 1996). Employees like those typified by Kaufman in *The Forest Ranger* (1959)—typically male, from rural areas, who were socialized via single-discipline oriented value systems—are retiring in large numbers. Entering personnel and employees currently moving through the ranks are likely to include more women and have more diverse backgrounds (i.e., urban, suburban) and multidisciplinary philosophies (Kennedy and Quigley 1989). As Decker et al. (1996) note, new professionals do not necessarily share the traditional values; many are interested in managing for a variety of values, sometimes different from the values that motivated their predecessors. These internal

value differences may, in part, help explain some of the struggles and inefficiencies inherent in our natural resource institutions today. But at the same time, these gradual changes in the workforce may eventually provide the human capital needed for addressing larger societal shifts.

The need to account for shifting value orientations, however, is not limited to the management sector. Solutions to environmental problems require interdisciplinary approaches, but researchers also often fail to incorporate, or recognize, the full range of values involved. Put simply, Cortner et al. (1996) asserted that our current methodologies for researching problems are insufficient to address today's resource management goals and challenges. Thus far, our research institutions have largely addressed the socioeconomic and biophysical components of systems separately. There has been a tendency to break the environmental puzzle into pieces and to give specific tasks to researchers with different areas of expertise. Typically the agenda is set by biophysical scientists who want information from social scientists that will fit neatly into their models (Jamieson 1994). Such an approach fails to recognize the cross linkages between critical environmental elements, especially the role of humans and our sociopolitical system.

This is not to imply that it is the social scientists who have ready answers for resolving the debate. Thus far, researchers have used opinion polls to ask people about their preferences for managing resources and surveys (in the form of questionnaires, interviews, and focus groups) to characterize public values and attitudes. But little has been done to find out about how (or if) people can weigh the costs and benefits of specific forest management problems and evaluate potential solutions. Essentially, what trade-offs are people willing to make for greater protection to forest systems? How much do people know about the risks and uncertainties of managing on an ecosystem level? How much environmental change is acceptable? What personal changes are citizens willing to make and for how long?

Trying to understand the connection between people's values and behaviors is problematic. Adding to the dilemma is the role of knowledge and the idea that increasing people's knowledge will lead to behavioral change. In a study on environmental attitudes and environmental knowledge, Arcury (1990) examined these notions. Although he found an association (albeit weak) between the two, the more interesting finding was that there existed a low level of environmental knowledge in the first place. This suggests that public perceptions may often be based on insufficient knowledge of the issues; but this should not be construed to mean that simply providing information will lead to understanding. We suspect that numerous compounding influences are also at work. In a recent review of the role of knowledge in public acceptance of ecosystem management practices, Aldred-Cheek and others (1997) found this to be a highly complex issue. Much more than just “giving people the facts,” knowledge and information exchange involves an array of contributing factors that influence how people respond. The theory of reasoned action, which is based on the assumption that people systematically process available information, pro-

vides a useful lens to view the relationship between environmental attitudes and behaviors (Fishbein and Manfredi 1992). For example, resource professionals will need to account for both scientific and experiential knowledge; recognize that people have preferred forms of information exchange and delivery systems; understand that various sources of information are viewed as more credible than others; and realize the degree of risk (uncertainty) associated with knowledge about a problem is highly relevant to citizens. It is clear that substantially more research in this area is needed if we are to adequately understand how knowledge affects public values for natural resource management.

Implications for Forest Management

Most forest professionals would agree with Franklin (1989) that the primary objective of public forest management in the Pacific Northwest is to maintain ecosystems as an interconnected whole, rather than purely for wood production or other extractive activities. Any holistic ecosystem approach to management, however, very quickly takes on the characteristics of trying to manage a mess. That is, our usual approach of drawing boundaries around particular systems is not very useful; too often we are presented with problems that cannot be solved in isolation from one another. Given the nature of our pluralistic society, with its shifting environmental values and growing public expectations about credible and inclusive decision processes, we are often beyond messes and are confronted with wicked problems. But pointing out that everything is ultimately related to everything else is not very helpful. What would be more useful are methods for sorting things out (King 1993). In these cases, Rittel and Webber (1973) argued for a planning model in which "an image of the problem and of the solution emerges gradually among the participants, as a product of incessant judgment, subjected to critical argument."

What is the answer then, to these complex (wicked) problems? How do we organize ourselves to deal with diverse values and expectations about sustainable forest management? Shannon (1992) asserted that the answer lies in the notion of informed governance. That is, we need places where people can learn, question, debate, and come to an informed judgment of what choices are best (FEMAT 1993). In *Coming to Public Judgment*, Yankelovich (1991) determined that the most critical barrier to making effective and informed choices in a complex world is the lack of forums in which the process of "working through" value differences and preferences can occur. There is growing support among natural resource professionals that a public dialogue must be an integral part of achieving social and political acceptance of forest practices (e.g., Bengston 1994, Clark and Stankey 1991, Shepard 1992). Regardless of value differences, if people are to come to an understanding of, if not agreement on, the problems and choices that confront public lands management, it is likely to be in public forums where open and honest discussion can occur. Unfortunately, from their research on adaptive approaches to forest management, Stankey and Shindler (1997) conclude that such forums are most notable by their scarcity.

Stankey (1995) helped identify the necessary components for civil public discourse in his comments about the pursuit of sustainability. He argued that in the complex and uncertain atmosphere that surrounds ecosystem management, the debate over achieving sustainable (forest) environments must encompass three central criteria. First, the debate must be informed. Public discussions about forest systems must strive for a common understanding of the environmental complexities, including known causes and effects, consequences of choices, and long-term implications. Ehrenhalt (1994) described this as the need to give people a rational menu if we expect them to make a rational choice about their future. In essence, public opinion is only meaningful when citizens have a reasonable understanding of more than one side of the issue. Although forestry professionals and the public both have a stake in developing a common competency level for productive discussions, the onus to ensure that this occurs is squarely on the forest agencies. Jamieson (1994, p. 27-28) described the situation directly:

In the bad old days there was a tendency for government agencies to dictate policy to citizens. These days there is a tendency for citizens to try to dictate policy to government agencies. There is an admission price for engaging in public dialogue. Part of the price is purely formal: to treat others with respect, to be sympathetic to alternative points of view, to strive for impartiality, and so on. Part of the admission price also involves knowing something substantive about the issues: the relevant science, the economics, the values and interests that are at stake, and so on. People do not come with a ready-made ability to engage in a constructive, deliberative dialogue. The Forest Service should do what it can to develop its own competence for engaging in this dialogue, but it also should contribute to developing the competence of those with whom it engages. Only then will the turn toward public participation be mutually educational.

Stankey's (1995) second criteria dealt with the deliberative nature of the discussion. That is, public discourse should proceed in such a way that there are real opportunities for mutual learning and reflective thinking. The notion of mutual learning encompasses the idea that there is no one receptacle or holder of essential knowledge, and that numerous forms of knowledge (scientific, experiential, anecdotal) can serve to inform the decision process. Further, by extending credibility to different actors and facilitating genuine attempts at inclusiveness, all parties can benefit from what the others bring to the discussion.

In their evaluation of adaptive/ecosystem management efforts, Stankey and Shindler (1997) acknowledged that any successful implementation of such programs will take time. There are few shortcuts available to lasting success, and there may not be any accurate way to estimate how much time is required to bring about full adoption of resulting forest policies. Unfortunately, the current resource management culture is one where the pressures for quickly demonstrated results prevail. Deadlines for performance, with decisions based on results at some usually arbitrarily selected date, typify much of our operational style today (Stankey and Shindler 1997). This situation is confounded by a high level of public frustration and citizen distrust with our federal

forest systems (Shindler et al. 1996). Any attempts at deliberative discussion and reflective thinking will need to find a way to incorporate patience into the process.

Finally, Stankey's (1995) third point was that the debate must be a discursive one. He described this as a forum that encourages interaction among the full range of stakeholders and interests. Delli Prisco and Homenuck (1990) warned managers that there are important considerations prior to engaging the public in dialogue. They describe a component integral to success as "up-front thinking," where agency personnel carefully think through and agree on a strategy for involving citizens. This includes addressing questions such as:

How will decisions be made?

What do we hope to accomplish by involving the public?

What is the public's "decision space?"

What does the public need to know in order to participate effectively?

Who is "the public" for this issue?

This up-front technique is important because it forces organization personnel to question each other and come to agreement about the public's role. Careful consideration of this initial planning step helps agencies organize themselves to be successful and can avoid costly problems later on.

Unfortunately, forest agencies have been slow to initiate effective planning/decision processes that are seen as genuine, honest attempts at listening to citizens (Shindler et al. 1996). King (1993) recognized that the crux of sorting out wicked problems is the genuine dialogue and real listening that occur when people map out boundaries and eventually see meaningful patterns in their interactions. Shindler and Neburka (1997) found substantial evidence for this view in research that identified numerous strategies for successful public involvement. They noted that both the forest managers and citizens acknowledged a positive cumulative effect from group interactions. Individuals involved in planning processes repeatedly emphasized how their positions softened as they got to know others at the table and realized that personal concerns were often common concerns. Whereas public consensus is not always achievable, the success of most interactions is that relationships are built with others.

Conclusion

Identifying people's values about forest resources is important, but it is not enough in today's complex struggle for sustainable forest solutions. Reaching more durable decisions requires comprehensive methods and a much different relationship among managers, researchers, and citizens. Ehrenhalt (1994) recognized that for people to make a rational choice about public policy issues they have to understand the consequences of the choices. This means that resource managers and politicians will have to learn to frame the alternatives more openly and more clearly to decide among the difficult but necessary trade-offs (Shindler et al. 1996). Public forums are a good place to debate more mean-

ingful forest policies and programs that address the problems of incomplete information. Improving our understanding of both the scientific basis and societal effects of complex environmental problems can also lead to better descriptions of cause-and-effect relationships that are more relevant for people. Change is more meaningful when it is translated into recognizable problems, such as deciding about how much to harvest, accounting for fish and wildlife, and protecting recreation places. These are recognized as genuine concerns because they affect people's livelihood and their quality of life. Such forums can enable people—resource professionals and citizens—to come to terms with the responsibilities of wide-scale forest stewardship. These conversations are more likely to be accomplished in local settings on scales that have real meaning for citizens, whose participation in long-term solutions is vital.

From a research perspective, social scientists can play a significant role in helping identify processes and strategies for coping with shifting values. For example, we can expand our methods to compile and analyze information that is most relevant to the real problems facing government decision-makers and worried citizens. It is not enough to report on attitudinal change or shifts in values. This is an age of experimentation in forest management, and our institutions are struggling to find the best ways to both incorporate public opinion and make decisions that protect the shifting environmental values of citizens in our postindustrial society. We can help develop forums for meaningful discourse between policy shapers and their constituents and provide tools that promote genuine interaction, mutual learning, and relationship building.

In summary, we should recognize that people often measure their interactions with forest agencies by the extent to which their values and concerns—not simply agency politics or the national debate—are given consideration in decisions (Shindler 1997). The ability to really listen to one another is essential in establishing trust, and trust is the central ingredient of working together effectively. More important, as King (1993) pointed out, *mistrust* is the dark heart of wicked problems.

Literature Cited

- ACKOFF, R.L. 1974. Redesigning the future: A systems approach to societal problems. Wiley, New York.
- AJZEN, I., AND M. FISHBEIN. 1980. Understanding attitudes and predicting social behavior. Prentice-Hall, Englewood Cliffs, NJ. 278 p.
- ALDRED-CHEEK, K., B. SHINDLER, AND A. MCQUILLAN. 1997. The role of knowledge in public acceptance of ecosystem management: A literature review. Res. Rep. Cascade Center for Ecosystem Manage., Corvallis, OR. 24 p.
- ALLEN, G.M., AND E.M. GOULD, JR. 1986. Complexity, wickedness, and public forests. *J. For.* 84(4):20-23.
- ARCURY, T. 1990. Environmental attitude and environmental knowledge. *Human Organization* 49(4):300-304.
- BELL, D. 1973. The coming of postindustrial society. Basic Books, New York.
- BENGTSON, D. 1994. Changing forest values and ecosystem management. *Soc. Natur. Resour.* 7:515-533.
- BLAIKIE, N.W.H. 1992. The nature and origins of ecological world views: an Australian study. *Soc. Sci. Quart.* 73:144-165.
- BRECHIN, S.R., AND W. KEMPTON. 1994. Global environmentalism: A challenge to the postmaterialism thesis? *Soc. Sci. Quart.* 75(2):245-269.
- BROWN, G., AND C.C. HARRIS. 1992. The USDA Forest Service: Toward the new resource management paradigm? *Soc. Natur. Resour.* 5(3):231-245.

- BULLIS, C.A., AND J.J. KENNEDY. 1991. Value conflicts and policy interpretation: changes in the case of fisheries and wildlife managers in multiple-use agencies. *Policies Stud. J.* 19:542-552.
- CABLE, S., AND C. CABLE. 1995. *Environmental problems: Grassroots solutions*. St. Martin's Press, New York. 143 p.
- CALDWELL, L. 1991. Globalizing environmentalism: Threshold of a new phase in international relations. *Soc. Natur. Resour.* 4(3):259-272.
- CLARK, R., AND G.H. STANKEY. 1991. New forestry or new perspectives: The importance of asking the right questions. *For. Persp.* 1(1):9-13.
- CORTNER, H., M. SHANNON, M. WALLACE, S. BURKE, AND M. MOORE. 1996. Institutional barriers and incentives for ecosystem management: A problem analysis. USDA For. Serv. Gen. Tech. Rep. PNW-GTR-354. 35 p.
- CRAMER, L. 1997. How human values, filters and perspectives affect riparian management. *In Proc. of the Riparian and Watershed Management Symp., Oregon State Univ. Ext. Serv., La Grande, OR.*
- CRAMER, L., J.J. KENNEDY, AND R. KRANNICH. 1993. Changing Forest Service values and their implications for land management decisions affecting resource-dependent communities. *Rural Soc.* 58:475-491.
- DALTON, R. 1988. *Citizen politics in Western democracies: Public opinion and political parties in the United States, Great Britain, West Germany, and France*. Chatham House, Chatham, NJ. 288 p.
- DAVIS, L.S., L.W. RUTH, D.E. TEEGUARDEN AND R.K. HENLY. 1991. Ballot box forestry. *J. For.* 89(12):10-18.
- DECKER, D.J., C.C. KRUEGER, R.A. BAER, B.A. KNUTH, AND M.E. RICHMOND. 1996. From clients to stakeholders: A philosophical shift for fish and wildlife managers. *Human Dimens. Wildl.* 1(1):70-82.
- DELLI PRISCOLLI, J., AND P. HOMENUCK. 1990. Consulting the publics. *In Integrated approaches to resource planning and management*, R. Lang (ed.). Banff Centre School of Manage., Alberta, Canada. 257 p.
- DUNLAP, R. 1992. Trends in public opinion toward the environment. P. 89-116 *in American environmentalism: The U.S. environmental movement 1970-1990*, Dunlap and Mertig (eds.). Taylor and Francis, Philadelphia.
- DUNLAP, R., AND A. MERTIG. 1991. Trends in public opinion toward environmental issues: 1965-1990. *Soc. Natur. Resour.* 4:285-312.
- DUNLAP, R., G. GALEUP, AND A. GALLUP. 1993. *Health of the planet*. Gallup Internat. Inst., Princeton, NJ. 155 p.
- EHRENHALDT, A. 1994. Let the people decide between spinach and broccoli. *Governing* 7(10):6-7.
- FISHBEIN, M., AND M.J. MANFREDO. 1992. A theory of behavior change. P. 29-50 *in Influencing human behavior: theory and applications in recreation, tourism, and natural resource management*, Manfredo, M.J. (ed.). Sagamore Publishing, Champaign, IL.
- FLANAGAN, S. 1982. Changing values in advanced industrial society. *Compar. Polit. Stud.* 14:99-128.
- FOREST ECOSYSTEM MANAGEMENT ASSESSMENT TEAM. 1993. *Forest Ecosystem Management: An ecological, economic, and social assessment*. USDA, USDI, and others. Portland, OR.
- FOREST CONSERVATION COUNCIL. 1992. Sustainable forestry initiative—recommendations for reform of Oregon's forest policy. *In Citizen's guide to Oregon's forest policy*, Talberth, J., and G. Kutcher (eds.). Webb Press, Corvallis, OR.
- FRANKLIN, J. 1989. Toward a new forestry. *Am. For.* 95(11-12):37-44.
- GALSTON, W. 1992. Rural America in the 1990's: Trends and choices. *Pol. Stud. J.* 20:202-211.
- INGLEHART, R. 1977. *The silent revolution: Changing values and political styles among Western publics*. Princeton Univ. Press, Princeton, NJ.
- INGLEHART, R. 1991. *Culture shift in advanced society*. Princeton Univ. Press, Princeton, NJ.
- JAMIESON, D. 1994. Problems and prospects for a Forest Service program in the human dimensions of global change. P. 23-28 *in Breaking the mold: Global change, social responsibility, and natural resource management*. Geyer, K., and B. Shindler (eds.). USDA For. Serv., Portland, OR.
- JONES, R.E., AND R.E. DUNLAP. 1992. The social bases of environmental concern: have they changed over time? *Rural Sociol.* 57(1):28-47.
- KAUFMAN, H. 1959. *The forest ranger*. The Johns Hopkins Press, Baltimore.
- KENNEDY, J.J. 1991. Integrating gender diverse and interdisciplinary professionals into traditional U.S. Department of Agriculture—Forest Service culture. *Soc. Natur. Resour.* 4:165-176.
- KENNEDY, J.J., AND T.M. QUIGLEY. 1989. How entry-level employees, forest supervisors, regional foresters and chiefs view forest service values and the reward system (USFS Sunbird Conf. Rep.). USDA For. Serv., Washington, DC.
- KING, J. 1993. Learning to solve the right problems: The case of nuclear power in America. *J. Bus. Ethics* 13:105-116.
- KNOPP, T.B., AND E.S. CALDBECK. 1990. The role of participatory democracy in forest management. *J. For.* 88(5):13-18.
- LOVRICH, N.P., AND J.C. PIERCE. 1986. The good guys and the bad guys in natural resource politics: Content and structure of perceptions of interests among general and attentive publics. *Soc. Sci. J.* 23:309-326.
- MCALLISTER, I. 1991. *Community attitudes to the environment, forests, and forest management in Australia*. Forest and Timber Inquiry, Resour. Assess. Commission, Canberra, Australia.
- MEIDINGER, E. 1997. Organizational and legal challenges for ecosystem management. Pp. 361-380 *in Creating a forestry for the 21st Century*, Kohm and Franklin (eds.). Island Press, Washington, DC.
- MILBRATH, L. 1984. *Environmentalists: Vanguard for a new society*. State Univ. of New York Press, Albany, NY.
- MILLER, M.L. 1992. Balancing development and environment: The third world in global environmental politics. *Soc. Natur. Resour.* 5(3):297-305.
- RITTEL, H.W., AND M.M. WEBBER. 1973. Dilemmas in a general theory of planning. *Policy Sci.* 4:155-169.
- ROBERTSON, F.D. 1991. The next 100 years of national forest management. *Transact. of the North American Wilder. and Natur. Resour. Conf.* 56:19-21.
- ROBINSON, D., M. ROBSON, AND A. HAWLEY. 1997. Social valuation of the McGregor Model Forest: Assessing Canadian public opinion on forest values and forest management—Results of the Canadian Forest Survey, 1996. *McGregor Model Forest*, Prince George, BC.
- ROSENAU, P. 1992. *Post-modernism and the social sciences: Insights, inroads, and intrusions*. Princeton Univ. Press, Princeton, NJ. 211 p.
- SALVAGE RIDER ACT. 1995. U.S. laws and statutes. Public Law 104-19, Emergency Salvage Timber Sale Program. July 27, 1995—16 USC1611.
- SALWASSER, H. 1990. Gaining perspective: Forestry for the future. *J. For.* 88(11):32-38.
- SHANNON, M.A. 1992. Foresters as strategic thinkers, facilitators, and citizens. *J. For.* 90(10):24-27.
- SHEPARD, B. 1992. Seeing the forest for the trees: "new perspectives" in the Forest Service. *Renew. Resour. J.* 8(Summer):8-11.
- SHINDLER, B., AND J. NEBURKA. 1997. Public participation in forest planning: Eight attributes of success. *J. For.* 95(1):17-19.
- SHINDLER, B., P. LIST, AND B. STEEL. 1993. Managing federal forests: Public attitudes in Oregon and nationwide. *J. For.* 91(7):36-42.
- SHINDLER, B., B. STEEL, AND P. LIST. 1996. Public judgments of adaptive management: a response from forest communities. *J. For.* 94(6):4-12.
- SIMON, H.A. 1956. Rational choice and the structure of the environment. *Psych. Rev.* 63(2):129-138.
- STANKEY, G. 1995. The pursuit of sustainability: Joining science and public choice. *George Wright Forum* 12(3):11-18.
- STANKEY, G., AND B. SHINDLER. 1997. Adaptive management areas: Achieving the promise, avoiding the peril. USDA For. Serv. Gen. Tech. Rep. PNW-GTR-394. 21 p.
- STEEL, B., P. LIST, AND B. SHINDLER. 1994. Conflicting values about federal forests: a comparison of national and Oregon publics. *Soc. Natur. Resour.* 7:137-153.
- STEEL, B.S., N. LOVRICH, AND J. PIERCE. 1992. Trust in natural resource information sources and postmaterialist values. *J. Environ. Syst.* 22:123-136.
- STEEL, B., M. STEGER, N.P. LOVRICH, AND J.C. PIERCE. 1990. Consensus and dissension among contemporary environmental activists: Preservationists and conservationists in the U.S. and Canadian context. *Environ. Plan.* 8:379-393.
- STEGER, M., J. PIERCE, B. STEEL, AND N. LOVRICH. 1989. Political culture, postmaterial values, and the new environmental paradigm. *Polit. Behav.* 11:233-254.
- TOURNAINE, A. 1971. *The post-industrial society: Tomorrow's social history*. Random House, New York.
- VINING, J., AND A. EBREO. 1991. Are you thinking what I think you are? A study of actual and estimated goal priorities and decision preferences of resource managers, environmentalists, and the public. *Soc. Natur. Resour.* 4:177-96.
- WHITELAW, E. 1992. Oregon's real economy. *Old Oregon*. 1:31-33.
- WONDOLLECK, J., AND S. YAFFEE. 1994. Building bridges across agency boundaries: In search of excellence in the U.S. Forest Service. USDA For. Serv. Res. Pap. PNW-92-0215. 313 p.
- YANKOLOVICH, D. 1981. *New Rules: Searching for self-fulfillment in a world turned upside down*. Bantam Books, New York. 185 p.
- YANKOLOVICH, D. 1991. *Coming to public judgment: Making democracy work in a complex world*. Syracuse University Press, Syracuse, New York. 290 p.