

Environmental Meaning and Ecosystem Management: Perspectives from Environmental Psychology and Human Geography

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The contribution of human dimensions research to the ecological paradigm emerging in natural resource management involves the development of contextually rich, and spatially and historically specific, understandings of places. As an eclectic and integrative field of inquiry, environmental psychology offers a growing body of research that promotes a view of the person as a social agent who seeks out and creates meaning in the environment. As developed in environmental psychology, research from the adaptive, goal-directed, and sociocultural paradigms is reviewed to illustrate alternative approaches to studying environmental meaning. These paradigms, taken together, provide complementary conceptual approaches for assessment and mapping of the diverse and often competing environmental meanings that various constituencies attach to natural resources. From human geography, the concept of place offers a framework for integrating environmental meanings into ecosystem management. Place constitutes a concrete focal point where natural forces, social relations, and human meanings overlap and can be integrated in theory and practice.

Keywords .Contextualism, integration, meaning, modernity, place, symbolism

The professional and scientific view of the environment usually suppresses its meaning. (Appleyard, 1979)

Theories from [the realms of] meaning and social relations often neglect space and place and become impoverished by this neglect. (Sack, 1992)

American land management agencies are increasingly challenged to address a broader range of meanings and values in natural resource management. Motivated in

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part by the past overemphasis on commodity production and economic efficiency, these challenges have led to greater consideration of biological diversity, ecologically sensitive silvicultural systems, and sustainable forestry (Salwasser, 1990). What some describe as a new paradigm of resource management (Behan, 1990; Bengston, 1994; Brown and Harris, 1992), has become formally instituted as the policy of "ecosystem management" within the United States Forest Service (Robertson, 1992) and other American land management agencies. Some in the social science community contend that this paradigm debate is due in no small measure to the failure of the natural resource profession to understand and legitimize emotional and symbolic meanings of natural resources—meanings that transcend the more tangible properties associated with commodity production and even ecological processes (Schroeder, 1992). Beyond a greater ecological consciousness, the new paradigm shifts the focus in two fundamental ways that have important implications for ecosystem management.

The first change involves extending beyond economic and even ecological concerns to include what some have described as the spiritual benefits (Salwasser, 1990; Schroeder, 1992) or deep values (Driver et al., in press) associated with natural resources. In its assessment of research priorities in forestry, the National Research Council legitimized intangible meanings of forests when it stressed the importance of forestry research to "secure the environmental, economic, and spiritual benefits of forests" (National Research Council, 1990, p. 58). In the long-standing instrumental paradigm, meanings were largely limited to tangible commodity uses grounded in an economic model. That is, the value of the land was defined by the products that could flow from it. Even the more intangible values such as recreation and amenity uses were rationalized as instrumental goods or products of land management activities (Williams et al., 1992). Shannon (1992) describes this as thinking of the human relationship to resources as involving the tangible "things" that a resource produces rather than thinking of the human relationship to the resource itself. Similarly, Rolston and Coufal (1991) describe the paradigm change as moving from commodities to communities. In essence, forests carry a broad range of meanings that are embedded in and embed the human community. The human community, however, need not be limited to social bonds, but can be understood as Leopold (1949) intended—as constituting relationships with and attachments to places in the landscape. Thus, one of the important challenges of the new paradigm is to connect the biophysical system with the social system of which it is a part (Shannon, 1992).

The second change in focus brought by the new paradigm involves recognizing the importance of a broader context or unit of analysis in natural resource management. From the perspective of natural systems, the new paradigm goes beyond a site- or stand-level analysis to embrace a landscape or ecosystem level. Larger units facilitate a more contextual and systemic understanding of the impacts of management decisions. The new paradigm also attempts to broaden the context by paying greater attention to dynamic aspects of ecosystems (i.e., paying more attention to natural history and change within ecosystems). To apply social science to similar contextual issues (the human experience of the ecosystem), the paradigm emphasizes the quality of *place* in the landscape as a means of understanding the human system. In the old paradigm, place was only considered in the more abstract sense of the spatial and temporal distribution of resource commodities; the result was to disembed the various elements, attributes, or features of natural resources from their spatial and temporal context. The concept of place embeds these resource attributes back into the system of which they are a part, remind-

ing managers that resources exist in a meaning-filled spatial (and temporal) context. Recognizing and understanding this context is the principal contribution of social science to ecosystem management.

In sum, an important aspect of developing a more contextual and human understanding of ecosystems is to expand the consideration of human meanings of a place; in essence, to pay as much attention to cultural history as to natural history. As resource management moves toward an ecosystem view, it is increasingly evident that social science applied to natural resource issues has failed to capture the full range of meaning the public often ascribes to the landscape. The new resource paradigm gives recognition to the idea that the landscape (place) carries a broad range of meanings—meanings that vary widely across individuals and social groups and that, in theory, can be mapped like other spatial-ecological data.

The purpose of this paper is to examine the potential for environmental psychology and human geography to contribute to an understanding of the human dimensions of ecosystem management. Environmental psychology constitutes a body of research that seeks an understanding of how the person as a social agent seeks out and creates meaning in the environment (Saegert and Winkel, 1990). Potential approaches to understanding meaning can be effectively illustrated through a review of the major research approaches within environmental psychology. A central aim of geography is to understand the human experience of place. Following a discussion of environmental psychology, the concept of place (as it is developed in human geography) will be discussed as a framework for integrating environmental meanings into ecosystem management.

Environmental Psychology

Environmental psychology represents both a specialty within social psychology and a broader “environmental” movement within social science and the design and planning professions. Its appearance in psychology coincides with the appearance of the late 1960s environmental movement, but it also reflects concerns within social psychology about the external or “ecological” validity of the laboratory experiment. Environmental psychologists are concerned with the large-scale or “molar physical” environment, and not just the immediate laboratory setting or microsocial setting. Thus, environmental psychology constitutes a branch of psychology that seeks to situate the individual in a macroscale, ecological context. It views the individual both as embedded in the environment and as actively defining and giving shape to it. Another reason to consider the potential contribution of environmental psychology to ecosystem management is that it is a particularly integrative and eclectic area within social science. As part of a broader “environment and behavior” research endeavor, environmental psychology is contextually rich and methodologically diverse.

This analysis of current and potential applications of environmental psychology to ecosystem management is structured around three research paradigms identified by Saegert and Winkel (1990): adaptive, opportunity structure/goal-directed, and sociocultural.¹ This section of the paper describes the basic features of each paradigm, how each has been or can be applied to natural resource research topics, and the strengths and weaknesses of each. Many of the natural resource examples come from amenity resource issues, perhaps reflecting the authors’ backgrounds, but also reflecting the fact that the individual-level analysis characteristic of psychology has been especially relevant to amenity topics.

The Adaptive Paradigm

Saegert and Winkel describe the adaptive paradigm as the most theoretically and methodologically mature of the three paradigms. Research from this perspective assumes that the goal of biological and psychological survival motivates behavior. Organisms attempt to cope with environmental threats or stressors and restore or expand adaptive capacities. Psychological functioning is seen as having evolved to meet adaptive needs.

Research falling under the adaptive paradigm can be characterized in three ways: how organisms come to know the environment, how organisms cope with stressful environments, and how the environment functions as a restorative or therapeutic medium. The first deals with such topics as Gibson's (1979) theory of ecological perception and the concept of cognitive mapping, in which human perceptual systems are adapted to facilitate functioning in an uncertain information environment. Adaptive approaches to environmental cognition support research on how the public responds to information in planning decisions, designing environments to enhance wayfinding and information pickup, and environmental learning and interpretation (Kaplan and Kaplan, 1982). Second, stress studies have looked for direct "dose-response" linkages between specific environmental stimuli, such as sound, water, and air, and psychological functioning. For example, a recent study used a dose-response model to evaluate the impact of aircraft noise on wilderness experiences (Tarrant, Haas, and Manfreda, 1995). The stress paradigm is also where much of the crowding and social carrying capacity literature can be placed (Gramann, 1982). Whereas the concept of stress portrays "the person as struggling against the environment to maintain health and well-being" (Saegert and Winkel, 1990, p. 450), the third area of research sees the natural environment as having an intrinsic capacity to promote healing and mental restoration. Kaplan and Kaplan (1989) propose a restorative hypothesis, and Kellert and Wilson (1993) present the case for what they call the "biophilia hypothesis." In this hypothesis, human responses to the environment are better adapted to natural stimuli; consequently, exposure to nature promotes well-being and affords an opportunity to recover from the stresses of modern, urban, "unnatural" environments.

The adaptive view has been very influential in natural resource management. Much of the research on landscape preference is premised on innate biological explanations (Ulrich, 1993). As a basis for understanding the meaning and value of natural resources, visual preference approaches have a number of advantages. Aesthetic models can be used to map important meanings of the landscape with considerable reliability, sensitivity, and commonality (Daniel and Vining, 1983). Further, aesthetic types of meanings are tangible (in that they can be mapped onto the landscape using formal, psychophysical, and psychological theories of scenic beauty) and emotionally potent, and they provide a widely valued basis for natural resource decision making.

As Saegert and Winkel point out, the advantages of the adaptive paradigm are that it focuses on highly valued outcomes such as health and well-being, an understanding of the compatibility of the environment with human needs, and the real and perceived control mechanisms for effective coping. Its weaknesses, they note, are that it treats the person as a biological and psychological individual and the environment as naturally given (i.e., meaning is determined at a biological level as a predictable response to features of the environment). Studies fail to place their data in the larger context of political, social, and economic factors that structure the environment and distribute control within society. With an internal focus, the adaptive approach ignores more active, interpretive, and

behavioral engagements with the environment. In short, the adaptive view is grounded in a bio-ecological ontology, suggesting ways that humans adapt to ecological reality. At the same time, it privileges biological reality while ignoring the social construction of that reality.

The Opportunity Structure/Goal-Directed Paradigm

Although less mature than the adaptive paradigm, the opportunity structure approach is perhaps the most widely applied approach in natural resource management because it explicitly concerns the process of selecting the best options within a system of sociophysical constraints and opportunities. In other words, humans are viewed as rational planners rather than responders to biological imperatives. Research in this paradigm seeks to identify the relationship between the behavioral requirements of goal-directed activity and qualities of the environment. Because it focuses on goals, individual differences (personality and roles) become more salient.

Research within this paradigm has focused on environmental appraisals based on the goal-fulfilling potential of the environment. Emphasis is given to how people process information in arriving at a decision, action, or evaluation. Consequently, theories related to attitude formation and decision making are prominent within the opportunity structure paradigm, as are studies of personal projects (a person's life goals) and behavioral mapping or ecology. This research approach can be seen in such natural resource applications as choice and behavioral modelling (Fesenmaier, 1990); recreation motivation and satisfaction (Williams, 1989); much of the work underlying nonmarket economics (Peterson, Driver, and Gregory, 1988); and studies of environmental attitude-behavior relationships and the associated methods of modifying attitudes and behavior through interpretation and persuasive communications (Manfredo, 1992). This paradigm is popular within natural resource management because it is well suited to the rational, instrumental, and commodity-oriented traditions of resource planning.

Within the opportunity structure or goal-directed approach, environment meaning is viewed as a relatively tangible property of the environment that has an instrumental relationship to behavioral and economic goals. Even the ostensibly intangible meanings of scenic beauty and recreational use often presuppose some instrumental or functional relationship to the environment. The adaptive view of landscape aesthetics (as an innate biological response) can be recast in the goal-directed paradigm as behavior focused on a prominent, overriding goal of environmental encounters (i.e., to experience a positive emotional state). The relationship between aesthetic goals and measurable landscape features can be readily identified (Hull, 1989). Examining amenity values in land management planning from the opportunity structure paradigm also leads to a focus on the numerous activities or goals that may be fulfilled through the recreational uses of a resource. A lake or stream affords fishing; physical remoteness affords solitude. The Recreation Opportunity Spectrum framework (Driver et al., 1987) enables managers to map specific biophysical, cultural (social), and managerial characteristics of a landscape that appear to facilitate particular recreation goals.

The opportunity structure paradigm emphasizes the importance of environmental composition or pattern in the fulfillment of individual goals. Its strength is that psychological models dealing with individual preference and choice provide ways to integrate nonmarket values into traditional economic analyses of policy alternatives. However, this approach

often makes tenuous assumptions of the rationality and volitionality of the individual, provides limited understanding of the socioeconomic and sociocultural (i.e., class and race) forces influencing opportunity structures and individual goal orientations, reduces environmental meanings to behavioral utilities, and generally ignores the symbolic environment.

The Sociocultural Paradigm

According to Saegert and Winkel, the sociocultural paradigm has not been central to psychology in the United States. Nor is it well developed in natural resource management. Being less "psychological," it is also the context within which the greatest disciplinary diversity appears and thus may offer fertile ground for integrative perspectives. The main concerns of the sociocultural paradigm are: (1) how meaning both structures and is structured by the environment, and (2) the link between macroscale sociocultural and economic factors and more social- and individual-level environmental concerns. Rather than viewing the person as an autonomous individual having survival needs and "project" goals, this paradigm views the person as a social agent who seeks out and creates meaning in the environment (Saegert and Winkel, 1990, p. 457). Emphasizing social interaction in this process leads to a focus on the interrelationships between the environment and group formation and maintenance.

Numerous investigators have noted the distinction between functional qualities of the environment, those often captured in the preceding paradigms, and more intangible, expressive, or spiritual meanings of the environment (Appleyard, 1979; Stokols, 1990). It is the concern for these intangible or symbolic meanings—and how they are created, shared, communicated, and destroyed—that is most associated with the sociocultural paradigm. In environmental design and planning, this interest is often expressed as place attachment, place identity, or sense of community (Altman and Low, 1992). Meaning and space are also important in understanding the role of the environment in group formation and maintenance. In the sociocultural paradigm, "communities of shared meaning" compete for control of territory—for how meaning will be assigned to a specific place or resource (Saegert and Winkel, 1990). Most, if not all, natural resource conflicts, even politics itself, can be understood as conflicts in the meaning of resources. Considerable attention of natural resource managers has been devoted to commodity, user, and interest group conflicts. But, consistent with the sociocultural paradigm, group processes and meanings are increasingly concerned with socioeconomic, ethnic, and gender-based groups (Williams and Carr, 1993). Clearly, many environmental disputes concern the social and spatial distribution of costs and benefits of environmental change. Natural resource managers are increasingly aware that the cost of environmental pollution and hazards are disproportionately borne by the least powerful, most marginalized segments of society (Bullard and Wright, 1990).

Whereas the more psychologically inclined have focused on adaptive and instrumental meanings, natural resource sociology has largely carried the banner for studies of social meaning and symbolism. Although some early work was applied to amenity resources (Burch et al., 1972), more recently sociology has shown greater interest in the meaning of nature as the sustenance base rather than in the intuited (experiential) meanings of nature (Spaargaren and Mol, 1992). A good example of social meanings of recreation places is Lee's (1972) study of how park meanings vary across sociocultural groups. Lee found that in a neighborhood park meaning is established through local territorial definitions and informal knowledge-based rules of ownership. In contrast, place meanings for regional parks and wildland settings are governed by formal rules of owner-

ship and use—rules that are often seen by ethnic minorities as White, middle-class, and exclusionary. Hester (1985) describes a case study of a small North Carolina coastal community where he used a variety of qualitative techniques to identify (and map) places that held “sacred” meaning to the local community. Until these meanings were mapped, many residents were not fully aware of the importance they assigned to them, suggesting to Hester that meanings are sometimes subconscious until threatened or highlighted.

At a more individual level, interest in meaning has often focused on concepts of place attachment and identity (Altman and Low, 1992). Although studies of place attachment have generally been associated with residential areas or communities, some attempts have been made to relate place attachment to natural or outdoor landscapes (Mitchell et al., 1993; Williams et al., 1992). Involvement with and attachment to places represent important mechanisms by which an individual actively constructs and affirms a sense of self. Particularly in American society, nature, wilderness, and the frontier have always been important contexts within which individual identity is situated and affirmed (Nash, 1982). Thus, places can be described as both enabling people to create individual meanings, apart from a primary group or community, and embedding them in a group or community, because they have meaning associated with them that can be passed along from the group to the individual (Brandenburg and Carroll, 1994).

Despite extensive involvement in environmental assessments and studies of resource-dependent communities, resource managers have not been deeply engaged in assessing sociocultural meanings of natural resources. Rather, concern for these meanings has often been deferred to or imposed by political, legal, or regulatory processes for assessing and assigning environmental meanings. Essentially, the various formal, legal designations for public land uses constitute political forms of meaning negotiation. The congressional venue for negotiating meaning has produced a plethora of specialized land use designations over the last three decades (e.g., wilderness, wild and scenic rivers, and historic landmarks). From a professional resource management perspective, these systems have often been viewed as usurping agency or expert prerogative to make sound resource decisions. Clearly, the intent of many of these policies is to lock up the meaning of specific tracts of land. However, from a sociocultural viewpoint, these policies constitute efforts to negotiate the meaning of certain resources. Such efforts are often advanced by circumventing what supporters regard as unresponsive or unsympathetic agency decision-making processes and values.

The main strength of the sociocultural paradigm is the recognition that environmental meanings extend well beyond biological imperatives and individual goal-oriented constructions, to include the ways in which meaning is socially structured. Although much of the research focuses on the social use of the environment to incorporate individuals into groups, American society is a multigroup mosaic. Relatively little work has examined group differences in access to the economic and political power necessary to create meaning and define the use of resources—the basis of much intergroup conflict (Saegert and Winkel, 1990).

In proposing the need for synthesis of the three paradigms, Saegert and Winkel (1990) note that findings from all three paradigms are largely products of specific historic or geographic contexts. They argue that the goal of finding general relationships continues to elude researchers and note that some have suggested it might be more appropriate to view person–environment relationships as necessarily specific to particular historical and geographic contexts. One implication is that, not unlike the shift in natural resource studies from the commodity to ecosystem paradigm, the emphasis in environmental psychology should shift from seeking generalizable relationships to seeking geographically

and historically specific ones. This idea is not so new to geographers, who have long struggled with the competing merits of a place-centered "provincialism" versus geographic "universalism" (Entrikin, 1991). Therefore, a more contextual and integrated understanding of ecosystem management, in addition to benefitting from a broader view of environmental meaning, may profit from geographic theorizing on the concept of place.

Human Geography

The shift from a commodity to an ecosystem paradigm implies a more geographically explicit understanding of the meaning and value of a landscape. From a disciplinary perspective, geography serves to remind resource managers that an ecosystem is as much a socially constructed place as it is a scientifically delineated space. This view involves both ontological and epistemological issues, as illustrated by Sack's (1992) "Relational Geographic Framework" (Figure 1). Ontology refers to the nature of reality and consists of the relations among the forces that constitute place. Epistemology has to do with how humans know reality and involves employing differing perspectives or points of view as a means of acquiring knowledge. Through this framework, Sack (1992) speaks quite directly, although not intentionally, to the challenge of integrating social science into ecosystem management.

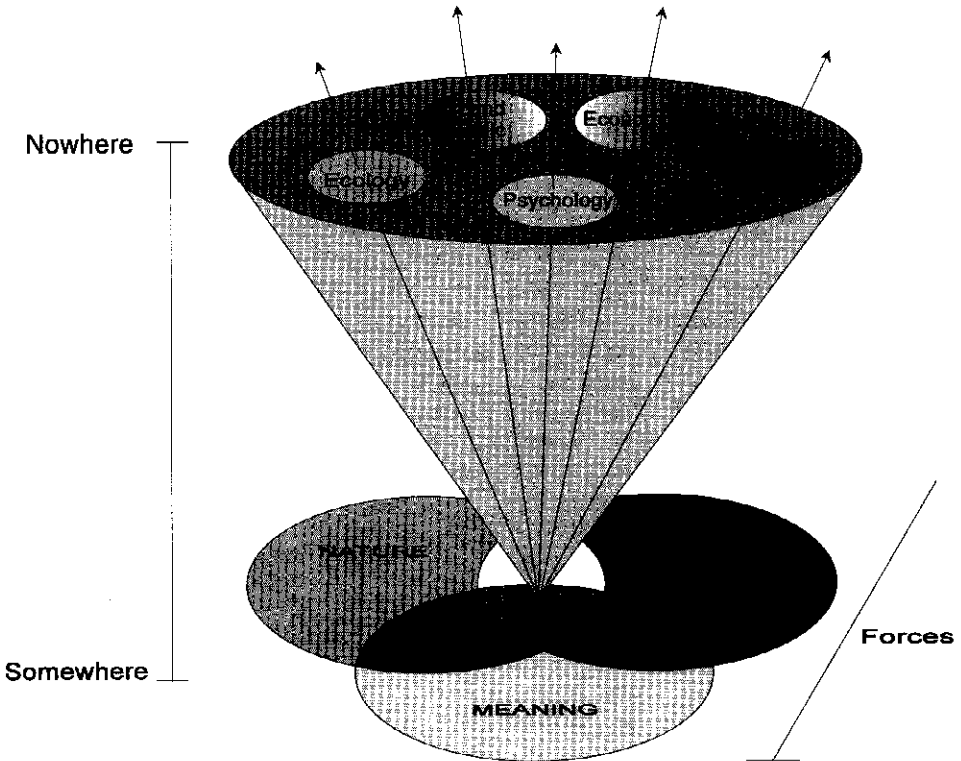


Figure 1. Natural resource perspectives within a relational geographic framework. Adapted from Sack (1992) with permission.

Sack's Relational Geographic Framework

For Sack, the geographic approach starts with the premise that "space and place are fundamental means through which we make sense of the world and through which we act" (1992, p. 1). He characterizes the ontological domain of modern social science as containing three realms of social forces (nature, social relations, and meaning), which converge at a specific point on the spatial plane (horizontal base of Figure 1) and create the everyday experience of place.² Nature refers to the physical, chemical, and biological aspects of phenomena and how these forces affect human life. The emerging ecosystem paradigm pays new attention to the systemic aspects of nature and their spatio-temporal distribution. Sack (1992) notes, however, that humans are products of both nature and culture; the latter consists of the realm of social relations (social, economic, and political forces) and the realm of meaning (ideas, values, and beliefs that give meaning to the world).

This trinity of social forces approximates the tripartite distinction drawn in the National Research Council (1990) report (see also Salwasser, 1990) between ecological, economic, and spiritual values. The concept of place constitutes a concrete focal point where these forces overlap and where integration can begin. However, because specific disciplines and specific theories typically do not address forces from other realms, integration is difficult in the abstract. Further, in those instances where theories from more than one realm are considered, the discussion is often aimed at pointing out the dominance of one realm by another.

In addition to examining the ontological forces that constitute place, places can also be viewed (experienced, understood, and explained) from multiple epistemological perspectives, as illustrated by the vertical plane in Figure 1. The epistemological significance of a spatial-ecological approach to resource management is that it highlights a dialectic tension between different modes of science. These differing perspectives have been described as occurring along a continuum from somewhere to virtually nowhere (Nagel, 1986; Sack, 1992). What is traditionally thought of as science involves the abstraction of a point of view from somewhere (the place of everyday experience) to a more remote, public, and distant point of view that is virtually nowhere. It does so purposefully. Abstraction is thought to increase the meaningfulness of findings "by making it possible to perceive them not as isolated bits of empirical information, but as a special case of the working out of a set of more abstract presuppositions" (Selltiz et al., 1967, p. 471).

The process of abstraction, although profoundly useful in many cases, has two undesirable consequences that are highly relevant to ecosystem management. The first is that abstraction is a decontextualizing process that results in a loss of meaning. The everyday experience or meaning of place is easily lost in scientific and rational discourse (Sack, 1992). In this late-modern age, many social critics see a kind of crisis associated with the decline (or "thinning," to use Sack's term) of place-based meanings—a crisis aggravated, according to Sack, by the tendency of modern society to privilege the view from nowhere. This was evident to the Forest Service policy team that reviewed the first round of National Forest planning (Larson et al., 1990). The highly abstract models used by the Forest Service carried little meaning for the public, utilizing output that was difficult to comprehend even among the planners. Methods of knowing that minimize or obscure important emotional or symbolic meanings of objects, events, or places, no matter how scientific they might be, are unlikely to be well received by those who sense the loss.

The second consequence of abstraction is that the process of moving from the highly subjective, but integrated, experience of place to the more public, external, and objective

experience tends to fragment knowledge along disciplinary and theoretical lines. Sack uses the image of an inverted cone rising and expanding above the horizontal (spatial) plane to illustrate how the process of abstraction isolates and segments human understandings of places. With abstraction from the horizontal plane of reality ("somewhere"), along the vertical plane toward "nowhere" comes greater segmentation between, and reduction within, disciplines or perspectives as they expand and diverge from one another. Specific vectors in the cone have been labeled in Figure 1 to provide illustrative examples of scientific and ethical perspectives found in natural resource management.

To summarize Sack: Integration may be achieved by making sense of multiple disciplinary "senses" of place. Focusing on place has the potential to integrate theory by creating more overlap among the ontological realms of nature, social relations, and meaning. In the instrumental view of natural resources, however, models dealing with natural forces discounted large-scale ecological processes. In social relations, resource management traditionally emphasized economic relations over political and community relations. Meanings were overly restricted to the tangible and instrumental, neglecting the historic, cultural, and spiritual. All the while, place was only considered in the more abstract sense of the spatial and temporal distribution of resource commodities. But, in addition to broadening ontological considerations, integration also requires finding points of view between somewhere and nowhere. This has been described by Entrikin (1991) as an epistemological position of "betweenness"—informed by scientific discourse, but also historically and spatially specific.

Implications for Ecosystem Management

Sack's framework reveals both the promise and problem of integrating the various social and natural science contributions to ecosystem management. Although there are commonalities across disciplines regarding forces, the differences between social science disciplines alone should not be minimized. At a macro level, social science has focused on how policies are socially and politically constructed and the impacts of resulting policies on communities. The emphasis is often on social facts and such issues as order, cohesiveness, and stability—structural properties of social systems. At an individual level, psychological approaches have generally favored studying meanings as individual-level phenomena expressed through motivations, experiences, benefits, satisfactions, and goals, paying little attention to how these meanings are socially structured. The challenge for natural and social scientists is to identify ways of transcending the fragmentary nature of scientific inquiry truly to inform ecosystem management.

The actual task of integrating multiple perspectives and disciplines is twofold: From a theoretical standpoint, the problem is to advance understanding of the realms of nature, social relations, and meaning and how they constitute place; how landscape or place meanings are socially created, transmitted, and destroyed; and how these meanings are negotiated between competing groups. Constructing social theories that address these issues is generally the province of discipline-based social scientists. However, theoretically oriented and discipline-based researchers are rarely interested in the peculiar problems of the professional resource manager. Thus, the second task is to develop practical knowledge and tools for managing the meanings of specific places in the landscape. This is the province of applied social scientists in natural resource management. To advance application, future research needs to develop specific ways to map landscape meanings in applied contexts that are sensitive to spatial, temporal, and group variation. More importantly, resource managers must recognize that they are both facilitators of and

participants in a process of negotiating the meaning and use of specific places in the landscape.

The task of identifying landscape meanings for specific land units is not likely to be achieved through a simple extension of resource inventory and analysis procedures to include broader and more intangible meanings (or the development of any other single methodology). The meaning and value of places or ecosystems are not inherent features of the landscape. Rather, potentially divergent meanings of the landscape are subject to continual mediation and modification through social interaction and institutional processes (Greider and Garkovich, 1994). In this view, public participation, planning, and policymaking must be understood as part and parcel of the creation, negotiation, and destruction of meaning, as ongoing processes that are inseparable from the efforts to map the natural and cultural significance of ecosystems. Thus, intangible meanings can be captured only through constant dialog among stakeholders and continuous public exercises in mapping the symbolic landscape.

Institutional changes are needed to respond better to the ways in which place meanings are created, negotiated, and destroyed. Specifically, institutional changes are needed to nurture the kinds of reforms in the public sphere or civic culture described by Yankelovich (1991) and Kemmis (1990). Current top-down, expert-driven, rational-scientific planning approaches tend to disembed meanings from their context. For Yankelovich, disembedded meanings are what pollsters capture in opinion surveys and should be distinguished from "public judgment," which results from working through issues in a real context to arrive at thoughtful, informed views on policy issues. Similarly, for Kemmis, decision making in the public sphere should depend less on a set of procedures, laws, regulations, or bureaucracies and more on human virtues and patterns of relationship—"the set of practices which enables a common inhabiting of a place" (Kemmis, 1990, p. 122). Thus, individuals, organized interests, and particularly communities as a whole need to be encouraged to seek out opportunities to work through conflicting meanings. This goal is best achieved not through the rational and comprehensive planning processes as they have been known, but through a *transactive* process (Friedmann, 1973) that is ongoing and collaborative.

Wicked Problems and the Limits to Integration

Greater understanding of and integration across the realms of nature, social relations, and meaning give no guarantee of solutions to natural resource problems. Greater understanding of the complexities of ecosystems will not eliminate conflict in meaning, unjust distributions of power, or ecological limits. Nor does it appear that science can give resource managers "decidable" or objective criteria for truth, because every so-called "fact" is an interpretation to some degree. Science does not decide ecosystem management issues, although science can inform decisions. In the end, ecosystem management is still, to use Allen and Gould's (1986) term, a "wicked" problem, one lacking a technical solution.

Integration is limited by ontological and epistemological concerns. At an ontological level, the inherent complexity within and across forces leads to reductionist responses. Further, past resource management models and the uneven power across disciplines tend to privilege some perspectives over others (i.e., nature and economic forms of social relations). The more problematic issues are the epistemological ones. The historical privilege given to "scientific rationality" tends to favor more objective, distant views, from nowhere. In the old utilitarian paradigm, it would be heretical to argue for a subjective view, closer to somewhere; subjective meanings and experiences have essentially no role

in scientific, rational decision making. Yet individuals, groups, and communities construct and experience places in the landscape in subjective ways that matter to them—ways that have been largely ignored by scientific resource management. To eschew these meanings because they are subjective is antithetical to capturing the multiple realities through which people experience and value places, ecosystems, and nature. The science needed to inform ecosystem management has to embrace the multiple constructions of place that occur along a subjective–objective continuum.

Despite the theoretical or scientific limits to integration, in practice integration occurs all the time; policies are promulgated and decisions get made. To build on Sederberg's (1984) definition of politics, resource allocation and management decisions involve the deliberate effort by individuals and groups to control the meaning of places or territories and the resources within them. The inherently uneven spatial (and temporal) distribution of forces makes for not only biodiversity and unique places, but also the uneven distribution of resources and the power to control and distribute them. There is no technical solution to natural spatial variation; solutions are ultimately political.

Conclusions

In the transition to an ecological paradigm for natural resource management, social science offers a rich and growing body of research that promotes a view of the person as a social agent who seeks out and creates meaning in the environment (Saegert and Winkel, 1990). Moreover, human geography reminds resource managers that quality of life, community, and environment are each bound up in the human ability to assign geographically specific meaning to actions. From a sociocultural perspective, a place (resource) may symbolize local or national heritage, ancestral ways of life, recreation opportunity, scenic views, valued commodities, rare habitat, or sacred rite. Each is a legitimate meaning for a place. Each can be threatened by another. Each is located in space and therefore capable of being mapped or referenced in a geographic information system. Each ultimately can be integrated with others—perhaps not through an elegant algorithm, but through social, institutional, and political systems that in practice function, sometimes imperfectly, to integrate all of the system's parts and processes.

Natural resources are not just raw materials to be inventoried and managed as commodities, but also, and more importantly, "places with a history, places that people care about, places that embody a sense of belonging and purpose that give meaning to life" (Williams et al., 1992, p. 44). Perhaps a shared and deep-seated desire for the reforms embodied in ecosystem management is a collective "sense of placelessness" wrought by excessive commodification of natural landscapes—the dissociation of meaning from place. Ecosystem management will be successful if it is guided by contextually rich understandings of social and natural history. It is likely to fail if it serves only to segment scientific discourse further by adopting a different but equally abstract and reductionistic perspective. Natural resource management needs an understanding that bridges the tension between somewhere and nowhere.

Notes

1. Saegert and Winkel (1990) use the word "paradigm" in this context to describe research approaches that share certain assumptions.
2. Sack (1992) recognizes a fourth realm, human agency, which emphasizes that these other forces are not determinate because humans have some freedom to construct meaning in highly indi-

visualized ways. Because it is difficult to isolate, agency is not normally considered an independent part of nature, social relations, and meaning.

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