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FEATURE

COLLABORATIVE LEARNING: IMPROVING PUBLIC DELIBERATION IN ECOSYSTEM-BASED MANAGEMENT

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Collaborative learning is an innovation in public participation theory and practice. It is designed to address the complexity and controversy inherent in public land management by combining elements of systems methods and mediation/dispute management. Collaborative learning activities put more emphasis on experiential learning theory, systemic improvement, and constructive discourse than do typical public participation programs. Collaborative learning was used in a series of public meetings held as part of the Oregon Dunes National Recreation Area land management planning process. The final plan incorporated several ideas that emerged from the process, and a follow-up survey of participants found favorable impressions of the collaborative learning framework.

Introduction

Natural resource management philosophies, policies, and practices are in transition. Natural resource management agencies have been organized in accordance with and have often acted in response to traditional multiple-use constituencies: timber, fish and wildlife, mining, livestock grazing, recreation, and water use (Culhane 1981; Rowley 1985; Clary 1986). More recently,

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ecosystem-based management (ESBM) has become a dominant theme in land management philosophy and widely incorporated into agency planning. Consequently, federal agency natural resource management is necessarily moving away from commodity and user-based policy orientations, beyond the grazing, mining, timber, and water "lords of yesterday" that have dominated the west for decades (Wilkinson 1992). Agencies such as the USDA-Forest Service and USDI-Bureau of Land Management are changing, redefining "use-management" into more complex systemic approaches, characterized as "ecosystem management," "natural resource sustainability," and "adaptive management" (Thomas 1994). ESBM, with its concern for sustainability, is focused more broadly than the traditional orientation. It requires systems thinking and consideration of cultural factors (Wilkinson 1992), while respecting interdependence, both naturally and socially constructed (Lee 1993). And it must involve "good science, good laws, good economics, and good communities" (Wilkinson 1992, p. 297). As a natural resource management philosophy, ESBM acknowledges that politics as well as science is an inherent feature of socionatural systems. Thus, conflict is embedded into the management planning process; it cannot be avoided by confining the discussion to technical or scientific issues.

Constructive approaches to conflict, with the best science discussed within a fair and just political process, are essential to good ESBM. To be constructive, a conflict management approach must foster ongoing learning and civic dialogue (Lee 1993). The interdependence among good science, good civic dialogue, good local knowledge, and good learning have not always been well accommodated by natural resource management organizations. As the Forest Service and other natural resource management agencies find themselves called upon to "reinvent" to better serve the public interest (Osborne and Gaebler 1992), they may want to review natural resource public participation methods and reconstruct them to better ensure high-quality discourse. We have reviewed traditional public participation methods elsewhere (Daniels and Walker 1993; Walker and Daniels 1994; Krannich et al. 1994). In this essay we focus on reconstruction by emphasizing the importance of learning in public participation processes and presenting a framework, which we call collaborative learning, as an effective example of a learning-based approach. After that, we outline its application to a specific natural resource conflict situation, the Oregon Dunes National Recreation Area management planning effort.

Toward Learning-Centered Public Participation

Ecosystem-based management must be both high-quality science and high-quality public policy. Since ESBM is based in part on emerging disciplines such as landscape ecology and conservation biology, there is still much learning to do. The complexity of land management over large scales is such that the

interworkings of all of the systems will never be fully grasped. Even when natural resource professionals become accomplished ecosystem managers, ongoing learning will still need to be an integral part of the process. This section examines the importance of learning in public policy formation generally and in ESBM in particular.

One caveat about this learning emphasis is warranted. A phrase common among natural resource professionals is that "if the public only knew what we know, they would agree with us; how can they be taught that what we are doing is right?" Such a statement certainly has a learning emphasis, but is based on a presumption that the worldview of the agency professional is both fully informed and somehow "right"; therefore the only participants needing to learn are the public. It also implies a narrow, unidirectional view of communication. The learning philosophy in this article rejects that perspective, particularly that agencies have nothing to learn.

Learning and Public Policy

Learning is an inherent feature of public policy decision-making. It is how people discover the range of public values and how those values can complement and conflict with each other. Social learning is the process of framing issues, analyzing alternatives, and debating choices in the context of inclusive public deliberation. "Both the process and the substance of policy decisions," Reich observes, "generate social learning about public values and set the stage for future public choices" (1988, p. 143). Social learning and decision-making may occur within a larger planning context. As Friedmann notes, social learning:

> begins and ends with action, that is, purposeful activity. It is a complex, time-dependent process that involves, in addition to the action itself (which breaks into the stream of ongoing events to change reality), political strategy and tactics (which tell us how to overcome resistance), theories of reality (which tell us what the world is like), and the values that inspire and direct the action. Together, these four elements constitute a form of social practice . . . practice and learning are construed as correlative processes, so that one process necessarily implies the other. In this scheme, decisions appear as a fleeting moment in the course of an ongoing practice. *They are embedded in a learning process* that flows from the attempt to change reality through practice. (1987, pp. 181–182, emphasis added)

A complex public policy situation is inevitably controversial because many parties with fundamentally different values perceive a stake in it. The complexity and controversy often produce an appearance of intractability, but they also render the situation ripe for learning. The process of defining the problem and generating alternatives makes for meaningful social learning as constituencies sort out their own and others' values, orientations, and priorities. As

Heifetz and Sinder explain, "because constituents may cling rigidly to one way of viewing the solution, the work of defining and solving problems must provoke learning. The act of sorting out their values and points of view on a complex issue, of debating the merits of various competing frames for the problem, is itself part of the adjustment process by which constituents achieve solutions" (1988, p. 189).

Public deliberation should focus attention on a problematic situation, set norms to describe and assess that situation, and generate shared understandings about "the boundaries of the possible in public policy" (Majone 1988, p. 164; see also Majone 1989). Learning is critical to each of these tasks. Too often, though, government agencies construct public deliberation processes so narrowly as to thwart learning, implying an assumption that the participants' interests are largely fixed and that the best one can hope for is a grudging compromise that perhaps satisfies no one. As Reich explains, "the failure of conventional techniques of policy making to permit civic discovery may suggest that there are no shared values to be discovered in the first place. And this message—that the 'public interest' is no more than an accommodation or aggregation of individual interests—may have a corrosive effect on civic life" (1988, pp. 146–147).

Reich's comments are applicable to traditional public participation activities. Whereas natural resource management agencies have typically gathered and disseminated information, they have seldom designed activities to promote social learning and civic discovery among diverse groups. Quite often, traditional public involvement tries to "inform and educate," presuming that the expert decision-maker simply needs to "impart knowledge" to a passive, receptive public (Wondolleck 1988). At worst, it is not particularly concerned about the degree to which the public understands the decisions and policies made. Yet to be effective, public deliberation needs more than public information; it requires forums that encourage social learning.

Such efforts, if successful, are consistent with the richest traditions of participatory democracy. For Reich, civic discovery is the opportunity for communities to debate their future. Constructive public deliberation is the means by which "opinions can be revised, premises altered, and common interests discovered" (1988, p. 144). Civic discovery can generate a variety of desired outcomes. Discovering deeper conflicts can lead to further learning and creative problem-solving. As Dewey surmised over 70 years ago,

> conflict is the gadfly of thought. It stirs us to observation and memory. It instigates invention. It shocks us out of sheep-like passivity, and sets us at noting and contriving . . . conflict is the 'sine qua non' of reflection and ingenuity. (Dewey 1922; cited in Johnson and Johnson 1994, p. 67)

The challenge in social learning is therefore not to resolve or eliminate conflict; rather it is to learn about complex issues in an inherently conflictual environment.

Learning and ESBM

Ecosystem-based management strives to effectively integrate both the science and politics of natural resource management. This is not easy to do, for a number of reasons. First, scientific and political systems operate on different time scales. The complexity of ecosystems prolongs the data-gathering process, and that in turn, complicates the policy decision-making process (Stanfield 1988). Second, uncertainty comes with even the best available science, because natural resource management questions are fundamentally ambiguous. Land management does not lend itself easily to controlled experiments, and the results of investigations conducted on complex ecosystems are rarely unequivocal (Stanfield 1988). Finally, as we have noted elsewhere, land management situations are complex (Daniels et al. 1993; Walker and Daniels 1994). No single party, agency, organization, or discipline holds the key to understanding a particular natural resource management situation. For any one party to assume that it "knows best," "understands fully," or "has all the answers" is presumptuous.

Mutual learning is therefore a critical element of ESBM. In order for ESBM policies to be crafted and implemented effectively, all parties must be open to learning from one another. Such learning can be interactive, emphasizing activities that encourage knowledge from various sources and perspectives. Within a framework of ESBM, such ambiguity should provide promise rather than pessimism. As Lee notes, "experiments often bring surprises, but if resource management is recognized to be inherently uncertain, the surprises become opportunities to learn rather than failure to predict" (1993, p. 56). Both the natural science and the social science of ESBM provide numerous opportunities to learn. Just as natural science experiments are typically continual as landscapes change, the public involvement activities they include should be ongoing as communities and social systems change.

Key Learning Assumptions

A fundamental understanding of how people learn is important to the effectiveness of public involvement efforts. This understanding begins with some assumptions about learning that should be reflected in the design of innovative approaches to public involvement.

Learning Is More Likely in Active Rather than Passive Situations

Throughout this century, leading learning theorists have noted the importance of learning as a *process*. Dewey, Lewin, and Piaget have offered different learning models, but all emphasize the importance of concrete experience as part of generalizing about the future. Learning methods that are disconnected from experience, each theorist would likely argue, would not produce genuine learning. When people are given opportunities to "do"—to participate in tasks, to speak from their experiences, to be "players"—they are more likely to learn than when they passively observe. Public deliberation tasks such as

planning, problem-solving, analytical and information-sharing discussions, debates, and collaborative dialogues foster learning and understanding better than public address activities such as speeches, hearings, and videos. Research on cooperative learning in classroom settings has demonstrated that people who are active perform better on learning and comprehension tasks than those who are passive (O'Donnell and Dansereau 1992). Fostering active learning requires instructors and managers to stop being merely presenters or speakers and become instead resource people, facilitators of learning processes, and coordinators of interaction (Sharan and Shachar 1994). Active learning respects the knowledge of the participants; it emphasizes opportunities for people to draw upon their experience and expertise and to learn from one another.

Based on the work of Dewey, Lewin, Piaget and others, Kolb (1984) has developed a theory of active experiential learning that is directly applicable to public involvement in ESBM. Kolb defines learning as "the process whereby knowledge is created through the transformation of experience" (1984, p. 38). It is both an adaptive and a transformative process that continuously creates knowledge and assigns meaning to it. Kolb's model contrasts with the traditional model of public involvement, in which knowledge is a rather fixed quantity external to the learner.

Learning Involves Several Distinct Modes of Thinking

The learning process involves transactions among four adaptive modes: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb 1984). These modes combine to form *learning dialectics*. The abstract/concrete dialectic consists of two opposite "prehensions": comprehension (conceptual interpretation and symbolic representation) and apprehension (felt qualities of immediate experience). The active/reflective dialectic is made up of two contrasting "transformations": intention (figurative representation of experience) and extension (active manipulation of the external world). These modes and dialectics combine to form four different forms of knowledge: divergent, assimilative, convergent, and accommodative. In explaining his model, Kolb notes that:

> the central idea here is that learning, and therefore knowing, requires both a grasp or figurative representation of experience [prehension] and some transformation of that representation. Either the figurative grasp or operative transformation alone is not sufficient. The simple perception of experience is not sufficient for learning; something must be done with it. Similarly, transformation alone cannot represent learning, for there must be something transformed, some state or experience that is being acted upon. (1984, p. 42)

The ways of knowing that Kolb describes combine in different arrangements, such that learning "at any given moment in time may be governed by

one or all of these processes interacting simultaneously" (1984, p. 61). The pattern of these interactions varies among learners, implying that "the learning process is not identical for all human beings . . . structures that govern learning allow for the emergence of unique individual adaptive processes that tend to emphasize some adaptive orientations over others" (Kolb 1984, p. 62).

Learning Styles Vary

The work of Kolb and other learning theorists indicate that there is no "right" or "wrong" way of learning. Rather, there are different levels of learning and different learning styles. Although learning and cognition are complex topics, any theoretical construct of learning recognizes that not all people learn in the same way. For example, some people prefer order and structure, whereas others prefer a degree of ambiguity (Vannoy 1965). Cognitive functioning varies among people as a feature of the cognitive domain, that is, the relevant content area (Kolb 1984). Cultural experience is also a factor; for example, different cultural groups may prefer different ways of thinking and patterns of reasoning (Pribram 1949; Glenn et al. 1977; Walker 1990).

In order for learning to be a constructive part of public involvement and agency decision-making, public participation activities need to be varied to account for different preferred learning styles. A traditional public hearing, for example, to the extent that it promotes any learning, may appeal to abstract conceptualizers but will likely do little for people who need more concrete experience or action. More participant-centered, innovative frameworks are likely to accommodate different learning styles.

Learning Is Improved by Systems Thinking

Systems thinking is at the heart of ESBM. "Ecosystem" conceptually integrates key features of "ecology" with central properties of a "system." Thinking about ecosystems, then, includes thinking about interrelated parts, holism, and emergent properties. In other words, understanding ecosystems requires systems thinking, and systems thinking is embedded in effective learning. Thus, learning-centered public participation lends itself particularly well to natural resource conflict situations, because it shares a systems foundation with ESBM.

A key learning task, as Kolb defines it, is to create knowledge by imposing meaning on experience through the interactions of modes of thinking and one's experience. The learner is not merely passively absorbing information, but structuring it into sets of relationships. In other words, the learner is cognitively structuring *systems*. A system can be thought of as "a set of parts that behave in a way that an observer has chosen to view as coordinated to accomplish one or more goals" (Wilson and Morren 1990, p. 69). Similarly, a system can be considered as "a perceived whole whose elements 'hang together' because they continually affect each other over time and operate

toward a common purpose" (Senge et al. 1994, p. 90). Both these definitions emphasize a system as something one perceives or constructs cognitively. Consequently, thinking about something as a system "is a way of imposing meaning on and shaping inquiry about experience" (Wilson and Morren 1990, p. 69).

Systems thinking includes those tasks, methods, tools, and principles oriented toward understanding the interrelatedness of forces and elements and viewing them as part of a common process (Senge 1990). Systems forces and processes can be thought of as "systems dynamics," whereas system elements or components can be thought of as "system structures." Systems thinking concerns both the dynamic and structural features and can occur on various levels. For example, modeling an organization as a system includes events, behaviors, interactions, and informal channels, as well as the components of a traditional organizational chart. Systems consist of many subsystems, each of which is understandable as a system. The structural and dynamic features of a system and the relationships among them change continually.

Understanding complex situations, such as natural resource management problems, is enhanced by systems thinking. Via systems thinking tasks, we can take "snapshots" of the situation and look at interrelated features. Assembling the snapshots improves comprehension of the big picture by revealing its many attributes and connections. Thinking systemically aids in discovering starting points for progress, and clarifies how progress in one area of the system may affect others.

Learning-Centered Public Participation as Negotiation

Even though ESBM will benefit from learning-centered public participation, natural resource management problems are more than mere "learning situations." The various parties bring different and often incompatible values, agendas, and strategies to situations that are complex, not only as ecological systems, but also as conflictual social systems. The substantive issues involved are entangled in a web of biological, physical, political, financial, and social factors, one that is even stickier when it involves mixed-ownership lands. There may be dozens of interested groups and individuals, and different people may be active players at different times. The members of the various interest-based coalitions may not all share the same views, so that factions within groups may be struggling for dominance. Finally, legal and procedural requirements may constrain an agency's flexibility considerably (Walker and Daniels 1994).

Public Participation as Negotiation

A key rationale for inviting the public to participate in natural resource management decisions is to craft a plan that satisfies, at least in part, competing interests. The same rationale underlies the process of negotiation. It may

not appear at first glance that public participation is a form of negotiation, particularly if one views negotiation as limited to offer/counter-offer convergence; i.e., haggling over the price of a car. A broader definition of negotiation is joint decision-making among parties with interdependent yet incompatible interests (Pruitt and Carnevale 1993). Understood in this way, negotiation clearly encompasses public participation of the sort we have been discussing. Fortunately, natural resource management can draw upon a substantial literature addressing negotiation and disputing behavior (e.g., Walton and McKersie 1965; Rubin and Brown 1975; Raiffa 1982; Pruitt and Carnevale 1993) and environmental disputes more specifically (e.g, Bingham 1986; Carpenter and Kennedy 1988; Crowfoot and Wondelleck 1990; Ozawa 1991). Understanding the motivations, cognitions, and constraints that shape the behavior of participant in negotiations, and the ways in which procedural choices affect both behavior and satisfaction, is foundational to developing public participation programs that contribute to agency function as richly as possible (Krannich et al. 1994). It is challenging to bring generalized theoretical notions of disputing behavior into field settings, and in this case there are some important differences between public lands ESBM and the settings in which environmental dispute resolution has typically succeeded. Nevertheless, useful insights from these fields can be brought to bear on agency public participation activities.

Public Participation and Competent Communication

An obvious insight from the theoretical disputing literature is that negotiation is a tremendously complex task. In a conflict-oriented natural resources situation, one must learn and communicate about:

- Technical, legal, and financial issues at hand
- Procedural issues
- Perceptions, concerns, and values of other participants
- One's own goals, and those of others
- Personalities
- Communication styles
- One's own set of options
- Relative benefits of different strategies

Even the simplest, most unambiguous two-party negotiation presents a daunting cognitive challenge: each party must develop a clear strategy, communicate clearly to the other party, accurately perceive their response, and then formulate a cogent response. On balance, therefore, it is easier to figure out why negotiations fail to reach their potential rather than explain why they succeed (Amy 1987). Disputes over natural resource public policy are profoundly more complex than the simple, two-party, unambiguous issues disputes that are the focus of much of the negotiation research. If simple

negotiation can produce error, complex natural resource disputes can produce utter bewilderment.

Effective public participation must be more than simply encouraging "citizen discourse" or "good communication." It depends on *communication competence*; that is, parties communicating appropriately and effectively (Lustig and Koester 1993; Walker 1992). Public involvement approaches that are philosophically consistent with ESBM will stress the learning of competent communication skills, which will aid in promoting careful, deliberate dialogue that respects both the scientific and technical knowledge of managers and the local knowledge of citizen participants.

Designing Models for Public Participation

In confronting the inevitable tensions between science and politics in order to manage ecosystems, natural resource professionals must be both "idealistic about science and pragmatic about politics" (Lee 1993, p. 161). Because science and politics are, in this arena, inseparable, public participation efforts need to emphasize competent communication, systems learning, and opportunities to work through different viewpoints.

Our earlier caveat—that agency personnel have as much learning to do as other participants—becomes important at this point, when one realizes that land management is not merely applied science but a complex public policy debate as well. There is no reason to assume that agency personnel are more adept in public policy negotiation that are other people. The cognitive psychology research into negotiation reveals a set of common, systematic errors in negotiation behavior, referred to as biases, which reduce negotiator performance (Bazerman 1994; Bazerman and Neale 1992; Thompson 1990; Thompson and Hastie 1990). Because these biases exist in the population at large, and because no effort has been made to train them out of agency personnel, the logical conclusion is that agency personnel are subject to these psychological phenomena, just as is the public with whom they are trying to interact.

This adds yet another motivation for learning-based public involvement. An active learning focus provides parties with opportunties to better understand the situation, to draw upon their experiences and contribute local knowledge, to discover areas of agreement and disagreement, to negotiate, and to develop tangible improvements. That being said, how might it be done? Many public policy frameworks have been developed that make progress on these goals, such as transactive planning (Friedmann 1973), strategic perspectives analysis (Dale and Lane 1994), consensus (Carpenter 1994; Tice 1993; Susskind 1993; Ozawa 1991), public consultation (Connor 1994), and conflict resolution (Delli Priscoli 1988, 1989). Although these approaches are useful, they lack an explicit learning foundation. We have developed and applied a method that lends itself to the particular challenges of public participation in natural resource situations by drawing upon work in systems and

ELEMENTS	SSM	ADR
Promotes Learning	High	Low
Emphasizes Systems Thinking	High	Low
Deals with Value Differences	Low	High
Handles Strategic Behaviors	Low	High

FIGURE 1. Collaborative learning as a hybrid.

learning theory, conflict and dispute resolution, and communication. We call this approach collaborative learning.

Collaborative Learning[1]

Collaborative learning (CL) is a framework for improving natural resource policy decisions through systems-based public involvement. It emphasizes activities that encourage systems thinking, joint learning, open communication, and focuses on appropriate change (Daniels and Walker 1993).

Collaborative learning is a hybrid of work in two areas (see Figure 1): soft systems methodology (SSM) and the alternative dispute resolution (ADR) fields of negotiation and mediation. By incorporating features of SSM and ADR, CL promotes *working through* the issues and perspectives of a situation.

From SSM: Learning and Systems Thinking

The origins of CL are in "soft systems methodology" (SSM), which applies theoretical work in systems and experiential learning (Wilson and Morren 1990). SSM stresses that learning and thinking systemically are critical to planning, making decisions about, and managing complex situations like natural resource controversies. Systems thinking and learning are areas that alternative dispute resolution methods, including mediation, typically disregard or consider peripheral to the settlement task. As Flood and Jackson (1991) observe, SSM "is doubly systemic since it promotes a systemic learning process, orchestrating different appreciations of the situation, which is never-ending, and it also introduces systems models as part of that learning process. The systemic learning process aims to create a temporarily shared culture in which conflicts can be accommodated so that action can be taken" (pp. 177–178).

From ADR: Values and Strategic Behaviors

Whereas CL's emphasis on learning and systems thinking come from SSM, the latter does not deal well with the value differences and strategic behaviors

[1] This term is used in the education field to refer to group learning activities such as peer-editing and mentoring. Our use of the term is substantially different.

characteristic of public land policy negotiation. The ADR areas of mediation and negotiation address this deficit, making ADR a strong second foundation for CL. Mediation, the intervention of an impartial third party into a dispute, deals well with significant value differences, which, as Moore observes, "are extremely difficult to resolve where there is no consensus on appropriate behavior or ultimate goals" (1988, p. 256). ADR, drawing on the strengths of mediation techniques such as identification and reframing, can address value conflict. Specific techniques include (1) transforming value disputes into interest disputes, (2) identifying superordinate goals (both short- and long-term), and (3) avoidance (Moore 1986, p. 178; see also Gray 1989). CL's strength in addressing values conflicts comes from these and other techniques of ADR.

Collaborative learning also borrows from ADR to address parties' strategic behaviors by incorporating methods designed to promote collaborative, integrative negotiation. CL encourages parties to identify and assess innovative approaches for settling their differences, including logrolling, bridging, nonspecific compensation, etc. (Lewicki et al. 1994). CL facilitators, like mediators, often use transformative strategies that encourage parties to engage in role reversal, mirroring, and future orientation. These all allow the parties to more fully understand the legitimacy of the perspectives of others, while not requiring that they compromise on their own core values.

Collaborative Learning and Communication

Collaborative learning has a dimension that goes beyond SSM and ADR. Successful CL processes sustain quality discourse: constructive discussion of ideas, collaborative argument, and interaction—in short, communication competence. It promotes productive dialogue that permeates the entire experience and fosters competent communication by developing and implementing guidelines for discourse and interaction guidelines (e.g., "ground rules"). CL emphasizes a number of interrelated communication skill areas. These include: (1) listening, (2) questioning and clarification, (3) feedback, (4) modeling, (5) social cognition, (6) dialogue, and (7) collaborative argument (Daniels and Walker 1993). These competencies constitute a collaborative communication system that is more comprehensive and instructive than the communication models in soft systems or dispute resolution alone (Walker and Daniels 1993).

Collaborative Learning: From Problem-Solution to Situation Improvement

Natural resource controversies are often discussed in terms of "conflict-resolution" or "problem-solution" (e.g., Crowfoot and Wondolleck 1990). Doing so imposes a burden on parties in conflict, perhaps an unrealistic one. They may be immersed in a complex, long-running, seemingly irresolvable

conflict that includes factors beyond their control. CL encourages thinking differently about controversies and policy decision situations. Thinking differently involves reframing; it means changing the language and perceptions of natural resource conflicts. A "conflict resolution" frame implies a "total solution" standard for success. CL redefines the conflict or problem as a "situation." Rather than trying to find the solution, parties develop improvements over the status quo situation. Results are measured in terms of *progress* rather than by some absolute standard of success.

Drawn from SSM, "situation improvement" is a critical component of CL (Checkland and Scholes 1990; Wilson and Morren 1990). Constructing improvements rather than solutions requires parties to understand situations in terms of their complexity. This understanding can be fostered by activities that require systems thinking, rather than linear, single-issue perspectives. CL achieves systemic learning by encouraging the participants to focus on their concerns and interests related to the situation, thus freeing them from the more rigid task of taking positions or making demands. Suggestions for improvements grounded in these concerns are ultimately debated to determine if they represent both "technically desirable and culturally feasible" change (Checkland 1981).

Collaborative Learning in Practice

Collaborative learning encourages people to think systemically and to learn actively with one another about a particular situation. Figure 2 outlines the various stages of CL's iterative process. The initial stages of CL emphasize common understanding. Activities might include information exchange, imagining best and worst possible futures, and visual representations of the situation, perhaps through the use of "situation" maps (Wilson and Morren 1990). In middle stages, CL participants focus on concerns and interests regarding the specific situation, and determine how those concerns relate to other concerns. Then they identify possible changes, or "situation improvements." In the latter stages, the participants debate these improvements, addressing whether or not they represent desirable and feasible changes in the present situation.

Throughout CL processes, participants talk with and learn from one another in groups of various sizes. A wide range of activities can facilitate such discussions; for example, a CL process may use a "2-4-8" approach to discussing situation improvements. After each CL participant has developed an improvement, she or he discusses that improvement with one other person. Those two join two others and talk about each person's improvements. Those four join four others and the process continues. Within these discussions, active listening, questioning, and argument are respected. People clarify and refine their improvements through dialogue. Consistent with the theme of "working through," CL emphasizes "talking with" rather than "talking at."

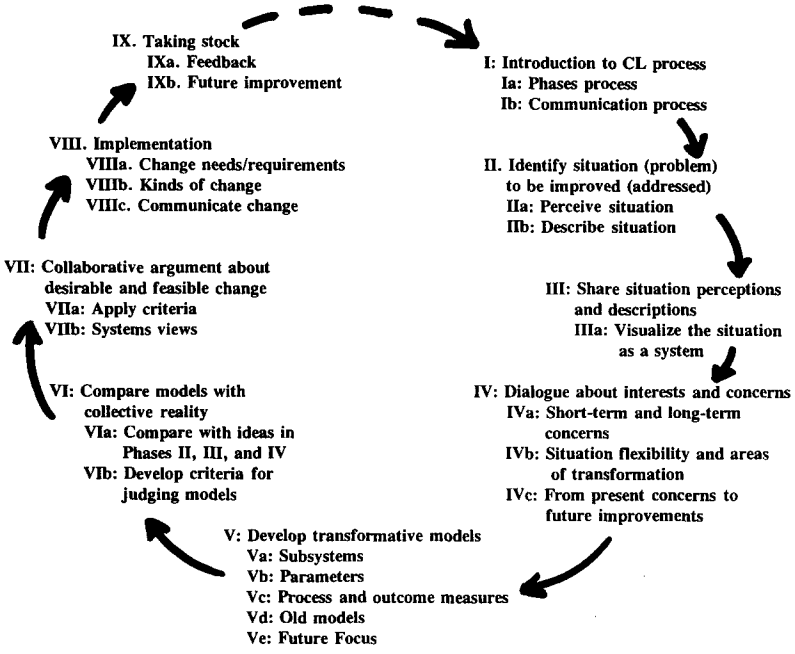

FIGURE 2. The Collaborative Learning (CL) Framework.

In sum, CL:

- Stresses *improvement* rather than solution.
- Emphasizes *situation* rather than problem or conflict.
- Focuses on *concerns and interests* rather than positions.
- Targets *progress* rather than success.
- Seeks *desirable and feasible change* rather than desired future condition.
- Encourages *systems thinking* rather than linear thinking.
- Recognizes that *considerable learning* —about science, issues, and value differences— will have to occur before implementable improvements are possible.
- Emphasizes *communication and negotiation interaction* as the means through which learning and progress occur.

These features have the combined potential to reconfigure traditional involvement into a more active learning process that provides the public with a meaningful voice in decision processes and agencies with more useful public comment. The next section addresses the ability to capture that potential through practice.

Collaborative Learning and the Oregon Dunes

Collaborative Learning workshops were conducted in 1993 as part of the Oregon Dunes National Recreation Area (ODNRA) planning process. The ODNRA, a unit of the Siuslaw National Forest, needed to update its legally mandated management plan. In addition to using traditional public involvement activities pursuant to the National Environmental Policy Act of 1969 (NEPA), ODNRA and Siuslaw National Forest leadership wanted to include a more innovative approach.

Background

The ODNRA consists of a 40- by 1.5-mile, 31,500-acre strip of land on the central Oregon Coast between Florence and North Bend-Coos Bay. The dunes system within the ODNRA has been part of the Siuslaw National Forest since 1908, when the Forest was established. By an act of Congress, the dunes became a National Recreation Area in 1972, to be administered by the USDA Forest Service for the purposes of "public outdoor recreation use and enjoyment . . . and the conservation of scenic, scientific, historic and other values contributing to the public enjoyment of such land and waters . . ." (Siuslaw National Forest 1993, p. I-1).

The ODNRA is a multiple-resource, multiple-use area. Major issue areas addressed in the planning process were off-road vehicle (ORV) management (e.g., access, noise, safety), nonmotorized recreation activities (e.g., hiking, camping, interpretation), vegetation (particularly nonnative European beachgrass), threatened and endangered species (e.g., the Western Snowy Plover), wetlands, wild and scenic river designation, user population management, and local community impacts, particularly economic impacts. The presence of ORVs in the ODNRA was the most contentious of these issues. Prior to the planning process, approximately 48% of the ODNRA was open to ORVs (Siuslaw National Forest 1993). The ORV community wanted more of the area open to motorized recreation. The dominant environmental organization in Oregon wanted ORVs excluded from the ODNRA.

The first ODNRA management plan was prepared during the late 1970s and adopted in 1979. In 1990 the Siuslaw National Forest leadership decided that the management plan needed revision. The National Forest Management Act (NFMA) of 1976 and the NEPA require preparation of an environmental impact statement (EIS) when a management plan with potentially significant impacts is revised. Public involvement is a significant part of EIS development and the planning process, as directed by NFMA and NEPA. Public involvement in the ODNRA planning process began in March, 1991. Initial activities included scoping sessions and a newsletter survey. In January, 1992, five draft management alternatives were presented to the public via open houses and a newsletter. Based on public response, three more management alterna-

tives were developed. In April, 1993, a draft EIS was published for public review and comment via open houses and letters. Approximately 4200 letters were received during the 90-day comment period.

To supplement the formal comment period, the ODNRA contracted with the authors to conduct a series of public workshops during the summer of 1993. "The workshops were intended to provide a public forum, involving people with varied interests, in which [participants could] test ideas and develop collaborative suggestions for improvement of several planning issues at the [OD]NRA" (Siuslaw National Forest 1994, p. 20). These workshops used CL and were intended to achieve two major goals:

1. *Supplement the ongoing public participation process required by NEPA*. The ODNRA had been conducting conventional public involvement activities such as open houses and letter writing. They were generally structured in ways that feature question–answer–comment sessions, or individual statements. Whereas these activities were very important, the CL workshops were designed to allow people to talk with one another about concerns, issues, and improvements. Through face-to-face discussions, people could learn about and test the ideas and views that may be expressed in letters or in large, formal public meetings. Workshop discussions could encourage people to go beyond competitive positions and attempt to find areas on which they could collaborate.
2. *Provide a forum for innovation and collaboration regarding the management of the ODNRA*. Public views related to the ODNRA were frequently stated as positions in opposition to one another. Citizen attempts to convince the decision-maker consisted of arguments in favor their particular "side" over any other. This type of communication, in effect, asks the decision-maker to arbitrate the conflict, the result of which may be a compromise that no one really prefers. The CL workshops were designed for collaborative discussions and decisions, to learn about the views of others, to locate areas of common ground, to generate improvements with diverse support, and to identify issues on which agreement did not seem likely.

Collaborative Learning Applied

The collaborative learning workshop project for the ODNRA included a number of steps, which were organized into three stages:

- *Stage I:* Inform stakeholder groups and involve them in process design
- *Stage II:* Provide a common base of knowledge about major dunes issues; Identify concerns about ODNRA management; Generate suggested improvements
- *Stage III:* Organize the improvements based on different strategic visions for the ODNRA; Debate the improvement sets

The workshop results were presented in a report to the USDA Forest Service and publics at the end of the project.

These CL steps were implemented through five ODNRA public involvement meetings: one for Stage I, three for Stage II, and one for Stage III. The Stage I meeting and the beginning of each Stage II meeting were devoted to the participants' learning about the CL process. At each Stage II workshop, the facilitators outlined the CL process and the ground rules for interaction. The ground rules emphasized various aspects of CL communication competence, particularly listening and collaborative argument areas. Activities at the Stage II workshops were designed to stimulate learning and the integration of scientific and public concerns. The content of the workshops varied between locations to reflect local concerns, but the workshop activities remained the same.

1. *Issue presentations.* The first portion of each Stage II workshop featured issue presentations addressing scientific and legal dimensions of ODNRA management. Talks were given on the snowy plover (a threatened species), European beachgrass (a nonnative vegetation that is encroaching on the sand dunes), wetlands legislation, ORV legislation, and recreation use. Each presentation included a question and answer session.
2. *Panel discussions.* After the issue presentations, each workshop included a discussion with panelists representing critical stakeholder groups. For example, the Florence panel consisted of a leader of the ORV community, a prominent homeowner with property adjacent to the dunes, and an environmentalist (affiliated with a state-wide or national organization). Panelists at the other workshops included a county commissioner, a chamber of commerce officer, and a local economic development expert. The panelists talked briefly about their viewpoints and concerns and those of the groups they represented. They then engaged the workshop participants and one another in a question–answer–comment session.
3. *Best and worst views and situation mapping.* In addition to the issue presentations and panel discussions, two active learning tasks were used to create a common understanding of the ODNRA situation. When participants arrived at the Stage II workshop, they were given blank cards and asked to write down their best and worst imaginable futures for the ODNRA. Workshop assistants transferred these "bests" and "worsts" to newsprint and displayed them on walls for all participants to see. This activity demonstrated that most people's interests in the ODNRA situation were far more compatible than either their prior expectations or positions may have indicated.

   A common behavior when dealing with situations as complex as the ODNRA is to choose a single cause and attribute all of the negative

features of the situation to it ("it's all due to ORVs"; "it's all due to beachgrass"; "it's all due to radical environmentalists"). A second activity, designed to promote more complex systems thinking was to build cognitive maps of the situation (called situation maps at the workshops). The purpose of situation mapping was to create a shared visual representation or "rich picture" (Wilson and Morren 1990) of the ODNRA situation that included enough material so that all participants could see their interests and concerns satisfactorily represented. A properly constructed situation map shows that a given situation has many possible causes and thus presents many possibilities for improvement. It is a systems view of the problematic situation, encouraging participants to think systemically about concerns, interests, needs, and situation improvements.

4. *Individual and small group tasks.* A third participant-centered learning task provided a transition from common understanding to action: identifying themes of concern and interests (drawing upon CL phases four and five). In this task, participants selected aspects of ODNRA situation, as shown on the situation map, that concerned them or that they thought could be improved. This activity paralleled "issue identification" in traditional problem-solving and "focusing on interests" in mutual gains negotiation (Fisher and Ury 1981). Participants identified concerns individually and then discussed them initially in pairs, followed by groups of six to eight. Concerns emerging from the groups were recorded on overhead transparencies and presented to the entire workshop.

The next active learning task took the discussion from concerns to improvements (CL phases four, five, and six). Based on their themes of concern and interests, participants generated ideas that they considered to be desirable and feasible improvements to the current ODNRA management situation or its preferred alternative. They developed improvements individually and subsequently discussed them in pairs and then larger groups. Participants engaged in some preliminary debate about the desirability and feasibility of improvements, although they primarily talked about the details of and need for the improvements.

The ODNRA Stage II workshops produced, via collaborative discussions, numerous statements of concerns and interests and a set of improvements for management of the ODNRA situation. As facilitators, we reviewed the workshops' 73 proposed improvements. This review resulted in a number of "draft improvement texts," much like single-negotiating texts (Raiffa 1982), which were then distributed to participants in the Stage III meeting. Three Stage II participants were solicited to develop their own "improvement texts" on the issues of ORV management, beachgrass control, and economic/community development. These, too, were distributed to Stage III parties. After discussing ground rules, Stage III participants organized themselves into

issue-centered work groups (e.g., beachgrass, ORVs). They discussed and debated these improvement texts, suggesting changes, additions, modifications, and deletions (CL phases seven and eight).

Substantive Impacts of the Project

After the Stage III meeting we prepared final versions of the various draft improvement texts and presented them to the leadership teams of the Siuslaw National Forest and ODNRA. It was the perogative of the Forest Service to adopt or reject any of the proposed improvements (a key legal consideration, in light of laws such as the Federal Advisory Committee Act of 1973). It is possible to compare the agency's Preferred Alternative in the draft EIS with the final outcome in the record of decision (ROD) to assess the impact of the CL process. There were three specific areas of change: a more sophisticated ORV management plan, a more aggressive beachgrass eradication program, and more emphasis on local community development.

The draft EIS proposed a series of restrictions on ORV use, including area closures to protect resources, noise-reduction buffer strips, and a uniform curfew prohibiting night riding (Siuslaw National Forest 1993, pp. 18,19, 24-30). The restrictions in the ROD included a phased-in noise reduction goals (decibel limits), buffer strips around residential areas (which ORV groups would help establish and enforce), and a variable curfew that retained night riding in the central (most isolated) portion of the ODNRA. The ROD also provided additional ORV routes through designated wetlands, and reduced the width of noise control buffers in one area (Siuslaw National Forest 1994, pp. 3, 7, 8). In short, the final plan offered at least as great a potential for reducing ORV-generated conflict as did the draft, but also allowed for highly valued activities such as night riding and access to key areas.

The DEIS stated that although beachgrass was spreading at perhaps 1000 acres/year, the Preferred Alternative was to treat only 100 acres annually, with the conclusion that "Chances of success of the control measures are far from certain. Most of the ODNRA would continue to change rapidly and be overrun with beachgrass" (Siuslaw National Forest 1993, p. 19). The CL workshops raised the awareness that the core values of ODNRA were all related to open sand, and that the spreading beachgrass was forcing everyone's activity onto increasingly scarce acres of open sand. Commitment to more aggressively combat beachgrass was the most unanimously shared view to result from the process. Indeed, common ground on various issues began to emerge as the beachgrass was identified as the factor that most restricted the physical common ground. The ROD included plans to treat 5000 acres over 10–15 years, stating that "The Forest Service will manage vegetation at the Oregon Dunes NRA more aggressively that we have been. . . .Almost everyone involved with review of the DEIS said the Forest Service should do something about this issue." (Siuslaw National Forest 1994, p. 12). The

priority areas for treatment were driven by habitat restoration for threatened or global species, reduce fire hazard, and restore natural dunal processes.

Whereas the DEIS spoke to issues of the community impact of the ODNRA, it was largely silent as to any agency efforts to enhance that process through the management of the ODNRA. The ROD is more assertive, with the deciding official stating that:

> In deciding management direction for the NRA, its economic importance, as well as its 'quality of life' importance, to nearby communities was a primary consideration in my thinking. I have made a diligent effort to strike a reasonable balance between the area's ability to contribute economically and long-term conservation of the resource values that contribute to a positive quality of life and for which Congress designated it an NRA" (Siuslaw National Forest 1994, p. 19).

In addition, the Forest Service committed to participate in local initiatives to explore local business opportunities related to the ODNRA, as well as in a proposed workshop of community development specialists, two concepts that emerged directly from the CL workshops.

ODNRA Collaborative Learning Project Survey Results

Whereas informal observation and post-workshop discussion suggested that the ODNRA workshops contributed positively to the ODNRA planning process, we and the ODNRA staff sought more concrete feedback. We developed and distributed a post-workshop survey to assess attitudes about ODNRA management processes and to measure perceptions of the workshops themselves. ODNRA workshops were held at various locations in July 1993. In mid-August 1993 surveys were mailed to the approximately 100 people who participated in one or more of the July 1993 workshops in Florence, Eugene/Springfield, or North Bend/Coos Bay. By mid-September, 39 surveys had been returned. A second mailing resulted in 15 more surveys, resulting in a total response rate of 54%. Of the 54 survey respondents, 38 participated in the entire day of a full-day workshop. The remainder attended either the morning or afternoon session only.

Survey Design

The survey included both open-ended questions and a number of statements to which individuals responded using Likert scales (1 to 5 or 1 to 7). Data from the statements are presented in this study; answers to the survey's open-ended questions have been reviewed and are generally consistent with the survey's quantitative results. The accompanying tables present mean values for these responses. In all cases, the higher the mean value (the closer to 5 or 7), the more favorable the response.

Survey Results[2]

Survey statements address the following areas:

Perceptions of the ODNRA management situation (Table 1).
Factors contributing to the usefulness of the Workshop (Table 2).
Judgments concerning the ODNRA workshop process (Table 3).
Assessment of specific workshop activities (Table 4).
Effect of the workshop on participants' views of ODNRA parties (Table 5).
Preferences concerning processes for achieving ODNRA goals (Table 6).

PERCEPTIONS OF THE ODNRA MANAGEMENT SITUATION. Five statements on the survey asked respondents to evaluate various aspects of the ODNRA management situation, with "5" representing "strongly agree" (Table 1). Responses were very strong regarding the desire for a flexible and adaptive management plan ($\bar{x} = 4.47$) and for management activities that involve the public ($\bar{x} = 4.72$). Survey participants also responded favorably to statements that constructive communication occurred about ODNRA issues and the understanding of ODNRA views, although these results were not particularly

TABLE 1. Responses to Statements about the Oregon Dunes NRA Management Process (1 = strongly disagree; 5 = strongly agree)

Statement	Respondents	$\bar{x}$	SD	*n*
Constructive communication is occurring ODNRA issues.	*total group*	*3.78*	*1.01*	*51*
	attended all day	3.89	0.89	38
	attended morning	3.36	1.29	11
	attended afternoon	4.00	1.41	2
At present ODNRA parties understand one another's ODNRA views.	*total group*	*3.20*	*1.06*	*51*
	attended all day	3.37	1.00	38
	attended morning	2.64	1.21	11
	attended afternoon	3.00	0.00	2
ODNRA views and concerns of other parties are as important as yours or those of your party.	*total group*	*3.49*	*1.65*	*53*
	attended all day	3.56	1.65	39
	attended morning	3.00	1.65	12
	attended afternoon	5.00	0.00	2
ODNRA management process should view the ODNRA management plan as flexible and adaptive to change.	*total group*	*4.47*	*0.89*	*49*
	attended all day	4.59	0.69	37
	attended morning	3.90	1.37	10
	attended afternoon	5.00	0.00	2
ODNRA management process should include activities that will involve the public as openly and completely as possible.	*total group*	*4.72*	*0.54*	*50*
	attended all day	4.76	0.49	37
	attended morning	4.64	0.67	11
	attended afternoon	4.50	0.71	2

[2]Survey results are reported as means and standard deviations. Because the sample size was constrained by the field nature of the research and because we are not calculating intergroup comparisons, measures of significance are not calculated.

TABLE 2. Assessment of ODNRA Workshop Factors (1 = not important; 5 = highly important)

Components	Respondents	$\bar{x}$	SD	*n*
Willingness of USDA Forest Service and other agency employees to participate in the ODNRA workshops.	*total group*	*4.82*	*0.43*	*51*
	attended all day	4.82	0.46	38
	attendedn morning	4.91	0.30	11
	attended afternoon	4.50	0.71	2
Collaborative learning process during the afternoon of the ODNRA workshops.	*total group*	*4.31*	*0.87*	*45*
	attended all day	4.29	0.90	38
	attended morning	4.40	0.89	5
	attended afternoon	4.50	0.71	2
The use of outside facilitators.	*total group*	*4.17*	*1.29*	*48*
	attended all day	4.33	1.17	36
	attended morning	3.70	1.57	10
	attended afternoon	3.50	2.12	2

strong. On all the management situation items, all-day workshop participants responded much more positively than morning-only participants.

FACTORS CONTRIBUTING TO ODNRA WORKSHOPS. Three statements addressed the contributions of various factors to the ODNRA workshops, with "5" indicating "highly important." As Table 2 shows, there was support for using outside facilitators ($x = 4.17$) in the workshop process. Respondents agreed very highly ($x = 4.82$) that the willingness personnel from the USDA Forest Service and other agencies to participate in the workshops was important to their success. Data also indicated that workshop participants believed that the CL process used during the afternoon of the workshop contributed positively to the discussions ($x = 4.31$).

ODNRA WORKSHOP ACCOMPLISHMENTS. The survey included 12 bipolar scale statements that asked for respondents' judgments about the ODNRA workshop process. Mean scores for these items appear in Table 3, with "5" representing "strongly agree." Many items in the survey were presented as "accomplished" statements: the workshop "allowed", "encouraged", "contributed", etc. General uniformity appears in the responses to these statements: the mean scores vary from 3.38 to 4.33. These results indicate general agreement that the ODNRA workshop process created a positive climate for discussing ODNRA management issues, despite the contentious environment within which they occurred. In this section of the survey, respondents reacted strongest that the workshops provided parties with an opportunity to generate ideas about the ODNRA ($x = 4.33$). On every item, all-day participants responded much more favorably than morning-only participants, mean value differences frequently approaching or exceeding one full point. The data indicated that all-day participation was important to viewing the workshop

TABLE 3. Responses to Statements about the Oregon Dunes NRA Workshop Process (1 = strongly disagree; 5 = strongly agree)

Statement	Respondents	$\bar{x}$	SD	*n*
ODNRA workshops were open and accessible to all interested people.	*total group*	*4.17*	*1.19*	*51*
	attended all day	4.34	1.07	38
	attended morning	3.55	1.44	11
	attended afternoon	4.00	1.41	2
ODNRA workshops provided parties with the opportunity to generate ideas about the ODNRA.	*total group*	*4.33*	*0.86*	*51*
	attended all day	4.53	0.73	38
	attended morning	3.73	1.10	11
	attended afternoon	4.00	0.00	2
ODNRA workshops allowed every party's ODNRA interests to be considered.	*total group*	*3.88*	*1.06*	*49*
	attended all day	4.03	1.03	38
	attended morning	3.22	1.09	9
	attended afternoon	4.00	0.00	2
ODNRA workshops encouraged open discussion and evaluation of ideas.	*total group*	*3.96*	*1.03*	*48*
	attended all day	4.13	0.96	38
	attended morning	3.25	1.17	8
	attended afternoon	3.50	0.71	2
ODNRA workshops promoted the development of coordinated improvements.	*total group*	*3.77*	*1.15*	*47*
	attended all day	3.89	1.12	36
	attended morning	3.11	1.17	9
	attended afternoon	4.50	0.71	2
ODNRA workshops helped parties understand aspects of and perspectives on ODNRA issues.	*total group*	*4.04*	*0.98*	*49*
	attended all day	4.29	0.77	38
	attended morning	3.00	1.22	9
	attended afternoon	4.00	0.00	2
ODNRA workshops led to the development of an ongoing, organized approach to coordinate progress on ODNRA matters.	*total group*	*3.38*	*1.09*	*45*
	attended all day	3.63	1.03	35
	attended morning	2.50	0.93	8
	attended afternoon	2.50	0.71	2
ODNRA workshops encouraged joint decision making.	*total group*	*3.55*	*1.29*	*49*
	attended all day	3.78	1.27	37
	attended morning	2.70	1.16	10
	attended afternoon	3.50	0.71	2
ODNRA workshops involved the public in ways different from other public meetings.	*total group*	*3.96*	*1.15*	*46*
	attended all day	4.08	1.05	36
	attended morning	3.25	1.49	10
	attended afternoon	4.50	0.71	2
ODNRA workshops included participants from all affected parties and interests.	*total group*	*4.10*	*1.01*	*49*
	attended all day	4.38	0.68	36
	attended morning	3.20	1.32	9
	attended afternoon	3.50	2.12	2
ODNRA workshops promoted learning and common understanding about Dunes issues and how they are interrelated.	*total group*	*3.81*	*1.15*	*47*
	attended all day	4.03	1.13	36
	attended morning	3.00	1.00	9
	attended afternoon	3.50	0.71	2
ODNRA workshops included opportunities for participants to argue constructively about issues, concerns, and recommendations.	*total group*	*3.74*	*1.15*	*47*
	attended all day	3.97	1.03	36
	attended morning	3.11	1.36	9
	attended afternoon	2.50	0.71	2

TABLE 4. Assessment of ODNRA Workshop Activities (1 = did not help; 5 = helped greatly)

Task	Respondents	$\bar{x}$	SD	*n*
Issue presentations	*total group*	*4.04*	*1.04*	*47*
	attended all day	4.19	0.92	36
	attended morning	3.55	1.29	11
	attended afternoon	–	–	–
Panel discussion	*total group*	*2.98*	*1.20*	*45*
	attended all day	2.92	1.15	36
	attended morning	3.22	1.39	9
	attended afternoon	–	–	–
Creating a situation map	*total group*	*3.26*	*1.33*	*38*
	attended all day	3.25	1.36	36
	attended morning	–	–	–
	attended afternoon	3.50	0.71	2
Identifying concerns and interests about ODNRA issues	*total group*	*3.92*	*1.06*	*39*
	attended all day	3.89	1.07	37
	attended morning	–	–	–
	attended afternoon	4.50	0.71	2
Developing ODNRA situation improvements	*total group*	*4.09*	*0.98*	*35*
	attended all day	4.09	1.01	33
	attended morning	–	–	–
	attended afternoon	4.00	0.00	2

as a success. Given that the morning sessions of the workshops involved presentations and a panel discussion, morning-only participants may have felt "talked at." Participants who remained for the afternoon (all-day) participated in collaborative learning activities that involved face-to-face discussion.

ASSESSMENT OF SPECIFIC WORKSHOP ACTIVITIES. One question set asked workshop participants to evaluate specific workshop activities, with "5" indicating "helped greatly." With the exception of the morning panel discussion, they assessed the tasks favorably (Table 4). Three activities – issue presentations, identifying concerns and interests, and developing ODNRA situation improvements – generated mean value responses of about 4, indicating that participants found these tasks helpful.

EFFECT OF THE WORKSHOPS ON PARTICIPANTS' VIEWS OF ODNRA PARTIES. The risk of damaging relationships is ever present in potentially contentious meetings, particularly if they get out of hand. The survey asked if the workshops affected the participants' views of groups represented at the meeting (Table 5). The response scale for this question ranged from 1 (more negative view) to 7 (more positive view), with 4 representing no change.
These results show only slight change in relationships, but mostly in a positive direction. The mean scores show improved perceptions of ORV users, ORV

TABLE 5. Assessment of the Extent to Which the ODNRA Workshops Changed Participants' Views of ODNRA Parties (1 = more negative view; 7 = more positive view; 4 = no change)

IR party	Respondents	$\bar{x}$	SD	*n*
USDA Forest Service	*total group*	*4.48*	*1.46*	*50*
	attended all day	4.55	1.35	38
	attended morning	4.30	2.00	10
	attended afternoon	4.00	0.00	2
Environmentalists	*total group*	*3.98*	*1.31*	*49*
	attended all day	4.16	1.28	37
	attended morning	3.60	1.17	10
	attended afternoon	2.50	2.12	2
ORV users	*total group*	*4.88*	*1.17*	*50*
	attended all day	4.76	1.17	38
	attended morning	5.30	1.16	10
	attended afternoon	5.00	0.41	2
ORV business people	*total group*	*4.61*	*1.26*	*49*
	attended all day	4.36	1.17	36
	attended morning	5.27	1.35	11
	attended afternoon	5.50	0.71	2
Nonmotorized recreation users	*total group*	*4.17*	*1.10*	*48*
	attended all day	4.47	0.88	36
	attended morning	3.40	1.08	10
	attended afternoon	2.50	2.12	2

business people, and USDA Forest Service personnel, and a more neutral mean response for environmentalists. These results show that the workshops did not harm interparty perceptions.

PREFERENCES CONCERNING PROCESSES FOR ACHIEVING ODNRA GOALS. The final question set on the survey asked about peoples' preferences for various processes or methods for achieving their goals related to the management of the ODNRA (Table 6). A response of "5" represented "strongly preferred." Six alternative processes were presented. Only one, litigation, generated opposition ($x = 2.50$). The process judged the most favorably was collaborative discussion ($x = 4.38$). Organizing alliances and coalitions and lobbying ODNRA management staff were in a moderately preferred or supported range. The interesting aspect to these results is that while people say they prefer face-to-face discussions to litigation, the latter is currently a more prominent forum for addressing natural resource disputes.

Summarizing Collaborative Learning and the ODNRA

The results from the quantitative portions of the survey seem encouraging regarding the ODNRA workshops specifically, and more generally for the potential of CL in addressing natural resource management issues. The survey

TABLE 6. Preferences Concerning Processes for Achieving ODNRA Goals (1 = strongly opposed; 5 = strongly preferred)

Method	Respondents	$\bar{x}$	SD	*n*
Organizing alliances or coalitions	*total group*	*3.60*	*1.07*	*48*
	attended all day	3.56	1.16	36
	attended morning	3.80	0.78	10
	attended afternoon	3.50	0.71	2
Collaborative discussions	*total group*	*4.38*	*0.77*	*47*
	attended all day	4.60	0.60	35
	attended morning	3.70	0.95	10
	attended afternoon	4.00	0.00	2
Litigation	*total group*	*2.50*	*1.56*	*48*
	attended all day	2.36	1.61	36
	attended morning	3.20	1.32	10
	attended afternoon	1.50	0.71	2
Letter writing	*total group*	*3.15*	*1.18*	*48*
	attended all day	3.00	1.26	36
	attended morning	3.70	0.67	10
	attended afternoon	3.00	1.41	2
Use of media	*total group*	*3.15*	*1.24*	*48*
	attended all day	3.17	1.25	36
	attended morning	3.30	1.25	10
	attended afternoon	2.00	0.00	2
Lobbying ODNRA management staff	*total group*	*3.21*	*1.35*	*47*
	attended all day	3.11	1.41	36
	attended morning	3.78	0.83	9
	attended afternoon	2.50	2.12	2

shows these participants regard collaborative discussion as the best means for meeting their ODNRA objectives, confirming results found elsewhere with larger samples (Force and Williams 1989). These processes promote face-to-face talk: information sharing, learning, problem-solving, and compromising. More importantly, through these methods parties maintain some investment in the management planning process and the ability to pursue their best self-interest. In the workshops themselves, we observed that participants conformed to the ground rules, including those that emphasize respectful behaviors and constructive communication.

The respondents not only supported collaborative discussion, they strongly supported the involvement of the Forest Service and other land management agencies, and considered the workshop design constructive in promoting agency involvement. Participants appeared to value government agencies not as mediators, but as fellow stakeholders. ODNRA participants appreciated the opportunity to work with agency representatives, to learn from them and with them.

The various learning-motivated activities—issue presentations, situation mapping, and generation of improvements—all seemed to be effective in

addressing the complex ODNRA management situation. People attending the workshops expressed through their participation a desire to work with, not against, government agencies and other stakeholder groups. The ODNRA CL workshops channeled that desire for involvement into a constructive approach to dealing with the ODNRA situation, and one that seems applicable to other natural resource disputes.

The results of this application indicate that a CL framework can help parties make progress on a problem situation. The evaluations of the ODNRA project and other applications indicate that in a CL process:

- Participants' understanding of the situation is broadened.
- Concerns are expressed, listened to, and meaningfully discussed.
- Improvements have been developed and implemented.
- Strategic behaviors persist.
- Relationships improve moderately.

Through CL activities, parties broaden their understanding of the situation by learning to see it as a complex system of issues. CL promotes discussion of stakeholders' concerns, from which parties develop tangible improvements that reflect their understanding of the particular situation as a system.

CL provides a structured approach to discussing and improving a problematic situation, such as those inherent in ecosystem management. CL does not require any reallocation of decision authority, nor does it try to limit parties' strategic behaviors. Self-interest typically motivates people to participate in a CL process. Further, it does not require consensus. At the ODNRA workshops, for example, consensus emerged only on the need for beachgrass management and economic/community development; disagreement persisted on the methods available to meet these needs. Consensus is not required to make progress. Parties' agreement on an issue or broadening of self-interest to include the interests of others stem from their own choices, based on their understanding of the situation and willingness to work through issues with others.

Collaborative Learning, as it was applied in the ODNRA situation, presumes that situations are dynamic, systemic, and changing. CL is a framework that can be adapted to a particular situation to generate:

- Dialogue among diverse communities: scientific, public, administrative.
- Integration of scientific and public knowledge about the problem situation.
- Increased rapport, respect, and trust among participants.

Although beneficial within an ESBM approach like the ODNRA situation, CL is no panacea or "silver bullet." It is one of possibly many frameworks that can involve people in meaningful learning and discussion about ecosystem management situations. It does not stress or demand consensus, but emphasizes learning, understanding, and developing improvements in the situation.

CL does not foster the development of a group "mentality" or "recommendations;" rather, it encourages parties to make progress on improving the situation as they work through issues, values, and concerns.

Finally, it is probably unrealistic to expect a one-day meeting to significantly alter relationships and views that have developed over many years and have been hardened by previous natural resource disputes. A valuable feature of the CL approach is that it does not depend on improved relationships to make progress, even though improved relationships may be a welcomed by-product, as the survey results suggest. The CL application on the ODNRA emphasized substantive progress rather than relational concerns, while also recognizing that the latter affects the ability to make progress on the former. Relational progress is a crucial long-term goal, but it is perhaps best achieved as a result of progress on substantive issues. If relational progress is viewed as a precondition to substantive agreements, a process can get locked into a superficial rhetorical posture.

Conclusion

In terms of addressing the policy challenges posed by ESBM situations, this article's discussion of CL should be viewed as illustrative of the kinds of policy processes that ESBM is likely to require. Various forms of public policy approaches centered around dialogue between agency personnel and citizens have been developed in recent years and the social and political forces that spawn these efforts more likely to increase than abate.

Designing policy processes that can accommodate ESBM essentially requires matching the tool to the task. One must think very carefully about the fundamental attributes and challenges of ESBM and then design public participation frameworks that are compatible with those challenges and robust in the face of them. Doing less is analogous to painting a room with a screwdriver; the mess that results may be worse that when one started.

Collaborative learning is particularly applicable to ESBM situations because it has been designed specifically to address the policy challenges of mixed-ownership public lands. As a result, it has three features that make it well suited to ecosystem-based management: (1) it explicitly adopts a systems approach to the situation and works to improve the participants' systems understanding; (2) it is more modest in its expectations for progress than the more frequently used rational-comprehensive models that seek solutions; and (3) it expects and attempts to accommodate a wide range of worldviews about land management and the strategic behaviors that those worldviews are likely to generate in controversial situations.

We predict that any situation in which ESBM makes progress will exhibit at least these three characteristics: a systems approach, realistic goals, and high political acumen. The ODNRA CL project represents just one example of a situation with these elements. Perhaps the core challenge is to make

progress on the paradox of public deliberation: be able to generate technically sound decisions, while simultaneously allowing stakeholders rich and meaningful voice in the process. The scientific burdens of ecosystem-based land management, combined with the range of interests in the mixed public and private lands, appear to require nothing less.

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