FORUM

Bioregional Conflict Resolution: Rebuilding Community in Watershed Planning and Organizing

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ABSTRACT / Watershed-based planning has been held as a vanguard for integrated ecosystem management based on a collaborative process. Watershed managers, however, must contend with conflicts that run much deeper than interests for economic development versus sustaining ecosystem health. With data from a survey of members of watershed organizations, we characterize the valued-based conflicts that watershed managers are likely to face in planning. We propose that utilizing collaborative decision-making strategies is important, but successful long-term watershed planning requires rebuilding a community-based infrastructure that can support important social and bioregional networks and partnerships.

This paper's focus is on the politics of collaborative decision making at the watershed level. Collaborative decision making has a number of features, including a reliance on scientific information, neutral facilitation and mediation, and the value of public participation. Achieving collaboration, however, requires more than the reliance on good scientific information, technology, and the resolution of value-based conflict. Collaboration can also be achieved by recognizing and cultivating shared understandings or commonly held values and beliefs that are inherent to community-based watershed planning.

We first describe the resurgence in watershed-based planning and organization. Second, we briefly characterize the values of formal and informal conflict resolution techniques and strategies. Third, the essay explores the discourse of watershed planning. The values on which watershed planning depend vary, but we show that they can also converge (McGinnis and Woolley 1997). From results of a survey of active members of watershed organizations from three river systems, we identify five value-based orientations or discourses. A discourse rests on a shared set of assumptions regarding the purpose and values of watershed organizing and planning. If these shared discourses are recognized and discussed, we propose that the collaborative development of watershed plans will be more likely than a process that focuses on conflict resolution. The adoption of strategies and techniques for collaborative decision making and conflict resolution may be necessary, but, the adoption of these strategies is not enough to ensure the long-term viability of the process of planning and implementation. We conclude with a proposal for watershed planning and organizing that builds on agreement and shared value-based orientations—a process that combines community-oriented planning and fosters the establishment of social and regional networks, relationships, and bioregional partnerships.

KEY WORDS: Conflict resolution; Watershed planning

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Background

Watershed management is not a new idea. John Wesley Powell (1890) proposed to Congress that new states in the semiarid West of the United States be organized and governed in accordance to appropriate watershed boundaries rather than straight-line political boundaries. For Powell, the watershed was the ideal medium for the management for arid lands. Powell's vision was not a new one but could be traced to the place-oriented life-styles and practices of native/indigenous/tribal societies (Powell 1890, Stegner 1953).

Today, because of the decline in ecosystem health (Noss and others 1995), there has been a resurgence in proposals and programs for watershed-based ecosystem planning. A watershed-based ecosystem management approach has been embraced by the Executive Office of the President (Gore 1993; White House Office on Environmental Policy 1994) and at least 18 federal

agencies (US Bureau of Land Management 1994, US Forest Service 1994, US Environmental Protection Agency 1994, US Department of Defense 1994, Morrissey 1994, US Department of Interior 1994, US Fish and Wildlife Service 1995, Montgomery and others 1995). The hope is that watershed management can succeed as the only rational way of governing an ecosystem (Western Water 1995, Rieke and Kenney 1997).

In addition to these government initiatives, an alternative grass-roots and bioregionally oriented movement exists in North America that is focusing on the importance of restoring a sense of place and community to industrial society (Lipschutz 1996, McGinnis 1998). Bioregionalism is a 200-year tradition of resistance against machine- and metropolitan-dominated culture (Sale 1985) and combines both philosophy and practice to support an ecologically and socially based activism (Dodge 1981, McGinnis 1993, 1995, Aberley 1998). The bioregional movement has evolved wholly outside of mainstream government, industry, and academic institutions. A focus of the movement has been the development and implementation of watershed-based protection and ecological restoration (Snyder 1990, 1995, Robertson 1996, Lipschutz and Mayer 1996, McGinnis 1999). Ecological science and conservation biology are important parts of bioregional strategies for restoring watershed ecosystems (Dasmann 1995). Generally, bioregionalists are involved in a process of cultural change at two levels—as a conservation and restoration strategy, and as a political movement that calls for devolution of power to ecologically and culturally defined regions and watersheds.[1]

Bioregional and watershed-based planning has been proposed as a comprehensive and integrated approach to preserve and restore ecosystem health based on ecological foundations and as a means to improve holistic regional scale management (Foster 1985, Slocombe 1993, Johnson and others 1998). In addition, watershed-based planning has been heralded as an innovative collaborative process (Yaffee and others 1996).

Across the United States, a number of watershed organizations are beginning to develop and implement plans and programs (Kier and others 1995, Rieke and Keeney 1997). Watershed-based approaches are based on the assumption that these organizations are means of conflict resolution, will secure ecological benefits, and maintain local control of local resources (Thomas 1997, among others). Despite the history of industrial society's exploitation of the natural world (Ludwig and others 1993), an opportunity exists today to forge cross-boundary and dynamic bioregional alliances between a wide range of interests that respect and care for particular watersheds. As Yaffee (1995, p. 381) maintains, ''A remarkable set of opportunities exists today for reinventing natural resource management policies and institutions so that they can better deal with challenges of the next century. The opportunities in part come from the development of new ideas and approaches in conservation science, social science, and organizational management.''

The federal government (primarily the Environmental Protection Agency), and, to some degree, state government have funded a number of watershed organizations. Generally, government supports a decision-making process that is based on the value of consensus. To gain cooperation of private property owners and water users, for example, resource agencies propose that watershed management decisions should be reached by consensus (Kier and others 1995). Their assumption is that it is better to address conflicts related to private property, for example, through a consensus-based approach and cooperation rather than regulation or litigation (Western Water 1995, Thomas 1997). In addition, because of the rural character of many watershed communities, resource agencies are seeking management approaches that support local control over local resources.

The Human Dimension to Watershed Planning and Organizing

The reemergence of the idea of watershed-based planning is an ambiguous one because it necessarily combines physical science with the diverse values of society. Although in a scientifically oriented society such as that currently prevailing in the West, we tend to think about an activity such as watershed planning in scientific and technological terms, it is important to keep in

[1]Frenkel (1994) describes the similarities and differences between environmental determinism and bioregionalism, while Alexander (1990) argues that bioregionalism is ecologically simplistic, and that natural regions are not necessarily congruent with functional and cultural ones. Defining a bioregion is a politically contentious process that combines both science and sensibility. Yet, many critics of bioregionalism fail to grasp the diversity of the movement. Cultural pluralism, community-based restoration, and multilangualism are bioregional norms. Gary Snyder (1990, p. 43) writes, ''We seek the balance between cosmopolitan pluralism and deep local consciousness. We are asking how the whole human race can regain self-determination in place after centuries of having been disenfranchised by hierarchy and/or centralized power. Do not confuse this exercise with 'nationalism,' which is exactly the opposite, the impostor, the puppet of the State, the grinning ghost of the lost community.''

mind that, like science itself, watershed planning is carried out in a context that is conditioned by culture and society. Despite recent advances in science and technology, planners cannot rely on scientific and technical information in the planning process. Sophisticated models of nature are helpful, but a watershed is first and foremost a social construct. No precise agreement exists about how to define a ''watershed approach'' nor is there likely to be such an agreement in the near future. In addition, the watersheds we inhabit are continually being transformed by human beings and change in accordance to physical processes. Watersheds have been significantly changed by human beings—rivers no longer flow to the sea because of dams and irrigation works, creeks have been channelized and paved, riparian zones degraded and destroyed, and the general public does not know where their water comes from or where their wastewater goes.

To define a watershed requires not only the use of scientific information and data but an understanding of the range of potential values and beliefs that influence boundary identification and the politics of watershed-based ecosystem planning (cf. Grumbine 1994, 1997). Geographically, the watershed approach uses hydrological units as the basic management boundaries. Biologically, information about vegetation types and animal ranges is also an important part of defining watershed boundaries. Culturally, the focus has been on collaborative, consensus-based decision making with the recognition that political affiliations, the history of land use and ownership, natural history, and economic considerations influence the decision-making process. Politically, as one moves from geography to biology to culture, subjectivity and value-based decision making increase (Robertson 1996).

A watershed is a culturally meaningful construct because of the associations, relationships, and partnerships that can be created. There are cultural and contextual conditions that influence the practice of watershed planning (Risser 1985, Lang 1986, Gilbert 1988, Francis 1993, Lee 1993) and collaborative decision making (Daniels and Walker 1996). Yet, the normative values that shape the politics of watershed planning and organizing have yet to be systematically studied.

The Value of Collaborative Decision Making

To resolve conflicts as they arise, resourceful watershed organizations have adopted formal conflict-resolution processes. Formal processes of conflict resolution typically have several key elements. First, a neutral party, who may be the same as the facilitator or mediator, completes an issue audit by conducting confidential interviews with key stakeholders. This results in a ''conflict map,'' a description of the interest groups that have a stake in the bioregion; it describes their position and orientation and relates each position to other groups (Carpenter and Kennedy 1988, pp. 71–91). A pool of financial and technical resources is then compiled to form the administrative foundation for the conflict-resolution process. Second, a neutral helper is then hired, often one of the major interest groups with a stake in the dispute who possesses the staff and financial resources to sponsor the negotiated dialog that will occur over a one- to five-year period.

The neutral helper works as a facilitator or a mediator, depending on the needs of the stakeholders taking part in the negotiation process. A facilitator typically focuses only on the administrative and procedural aspects of the negotiation, such as chairing meetings so they run smoothly, preparing meeting agendas and keeping minutes of the proceedings. A mediator typically assumes a more active role than a facilitator. Mediators become involved in helping the parties craft elements of agreements, intervene to resolve stalemates, and often possess substantial technical expertise in the issues being negotiated by the parties (Susskind and Cruikshank 1987, pp. 152–185). Possessing substantial technical and policy expertise in the issues being negotiated (e.g., water and forestry resources, regulatory decision making, endangered species protection, etc.) are often perceived to be critical for mediation or facilitation of disputes.

The issue audit identifies the issues and policies the stakeholders wish to address in the negotiation. The facilitator or mediator then creates an agenda for the first negotiation session that reflects these issues. With this information, he or she can often plan several future meeting agendas as well. The neutral helper also prepares several documents that form the foundation of the negotiation, including a draft mission statement and rules for behavior, information sharing, and consensual decision-making in the form of ground rules. A conflict resolution process has a much greater chance of success if these preconditions are met.

A well-designed negotiation process also includes a comprehensive joint fact-finding process, whereby the participants jointly describe what information they need to make an informed decision. The neutral helper (the facilitator or mediator) then recruits qualified scientists, to collect, analyze, and communicate the findings to the participants. Peer review panels, also established by the neutral helper, are used to provide quality control of methodologies, assumptions, data sets and

findings.[2] The set of tasks carried out as part of a joint fact-finding process comprises an essential ''translation step'' that is key to unlocking science intensive deadlocks.

Not all watershed organizations have the necessary resources to employ a mediator or facilitator. Due to lack of resources, most watershed organizations cannot follow these formal mediation strategies. More often than not, participants in watershed organization and planning must rely on less formal conflict-resolution strategies. Seven general characteristics of less formal collaborative decision making are (after Gamman 1994):

1. Representation and assistance for weaker parties. A process can only be successful if all of the agencies, groups, and individuals with a stake in the outcome are represented at the negotiating table. This means that any party who possesses veto power (e.g., has legal standing and can file a lawsuit or make an administrative appeal to block a decision) needs to be included in the negotiation. In addition, representatives to the negotiation who lack technical and financial resources require support.
2. Equal access to scientific information. Informed decisions are dependent on the development and use of high-quality, clear, and well-documented scientific information. The path of gathering scientific information should be made accessible to participants in watershed organizations.
3. Participation. Once representation is assured, participants have to be given a full and fair opportunity to participate in the negotiation process.
4. Accountability and legitimacy. Participants in a collaborative processes need to be held accountable for decisions they make and agreements to which they are a party. This requires that representatives at the table report back regularly to their constituency to ensure broad buy-in to agreements. To provide the necessary legitimacy, the process should: (a) account for the attitudes and perceptions of the participants, (b) represent the interests of all participants, and (c) be shown what they can gain from participation.
5. Commitment to the process. Participants and the organizations they represent must be fully committed to the collaborative process. This includes offering resources for the use of the negotiation process (scientific, educational and political resources) to ensure that agreements that emerge from it will be implemented.
6. Sustaining cultural values. Watershed and ecosystems include human inhabitants and communities that possess social values and concerns. The citizenry places different values on how to organize and conduct human activities in the watershed and ecosystem.
7. Creating adaptive decision making. As ecosystems are better understood, this information needs to be feed back in to the collaborative decision-making process. Successful negotiation processes change the nature of the relationship between human culture and ecology. Organizations developing new management strategies as an outcome of collaborative processes should therefore be flexible and allow experimentation, in order to adapt to these changing cultural values, perceptions, political pressures, scientific data, and ecological conditions.

The best way to illustrate the promise of the principles of collaborative decision making at the watershed level is by example. The following cases are diverse in scale and participation and include organizations that have employed conflict resolution techniques. The goals of the case studies are to describe the nature of the conflict inherent to each watershed effort and the use of conflict-resolution strategies to resolve value-based disputes.

Applications of Collaborative Decision Making in Watershed Organization

We briefly describe cases in watershed organizing and planning that exist in three river systems—the Sacramento and Santa Ynez rivers in California, and the Yakima River in Washington. Our study includes a number of watershed organizations that have developed to address conflicts that are related to an entire river system (such as the Yakima River Watershed Council in Washington) or watersheds that exist within a river system (the upper Sacramento River and Santa Ynez River in California). Each watershed organization exhibits the following common features: (1) each is a spatially distinct part of a river basin; (2) each case exhibits a particular social and economic identity and is recognized as a place of commercial activities, production, and renewal; (c) each case has developed a collaborative process and an administrative body (e.g., watershed council or conservancy) to plan for the

[2]A good example of joint fact-finding is the establishment and use of a peer review panel by the CALFED Bay-Delta Program, which conducted a facilitated scientific review focusing on its Ecosystem Restoration Program Plan. The facilitator hired by CALFED invited participation from eminent restoration scientists with experience in fisheries biology, estuarine ecology, salmonid fisheries, terrestrial ecology, stream ecology, and plant and community ecology drawn from six states and several large-scale restoration projects.

watershed; (d) each case involves a range of participants, such as resource agency personnel, environmentalists, private property owners, and members from government; and (e) each case involves conflict over the protection of endangered species.

Upper Sacramento River

In the Sacramento River, salmon and riparian habitat have significantly declined in the last three decades. One hundred fifty years ago, the Sacramento River was bordered by nearly 500,000 acres of riparian forest with riparian vegetation extending 4–5 miles wide (The Resources Agency 1989). This vast habitat served the needs of a range of native and human inhabitants. Development in this area has led to a 95% reduction in riparian habitat (The Resources Agency 1989). Because of the reduction of habitat and the establishment of a complex network of irrigation and hydroelectric facilities, cattle grazing, and human developments, salmon were listed as endangered species. Under the Endangered Species Act of 1973, recent listings include the coho salmon (1996), steelhead trout (1997), and chinook spring salmon run (1998). Additional state and / or federal threatened or endangered species include the bald eagle, western yellow-billed cuckoo, Swainson's hawk, and the valley elderberry beetle, among others.

A number of watershed organizations have been formed by private property owners (primarily ranchers and farmers) to deal with a range of concerns in the upper Sacramento River area. For example, the Mill and Deer Creek conservancies were initially created by landowners to protect their private property rights and to circumvent proposals from environmentalists to protect parts of the river. These creeks are located in watersheds that provide critical spawning and rearing habitat for steelhead and spring-run chinook salmon. These two conservancies include members that own large parcels within the watershed. Indeed, a condition of membership is that one must own property. The more property one owns, the more representation one receives during the planning process.

Other watershed organizations have been created, such as the Butte, Battle, and Clear Creek conservancies; each involves a complex mosaic of private and public lands, and in the case of Butte Creek, urban and rural development. Membership in these groups is not limited to property owners and includes urban and suburban representation.

Many key participants in these watershed organizations are members of an informal public forum, the Spring-Run Chinook Salmon Workgroup. With partial funding from the University of California Cooperative Extension Program, the workgroup holds facilitated monthly meetings to discuss issues and concerns related to the river, salmon, and particular watersheds. The workgroup serves as a crucial social network that has fostered the building of relationships and partnerships across watershed alliances and communities. For several years, the late Nat Bingham, a well-known and respected fishery advocate, served as coordinator and facilitator of the meetings. The workgroup also serves as a coordinating mechanism, which has been shown to be imperative to the successful restoration of habitat and declining salmon runs (e.g., winter and spring chinook, steelhead trout, among other wildlife) (Doppelt and others 1993; Lichatowich and others 1995).

Santa Ynez River

The Santa Ynez is the longest river in south-central California and is blocked by two dams. In 1997, the river's steelhead were listed by the National Marine Fisheries Service as an endangered species. In addition, the red-legged frog, willow fly catcher, California least tern, and snowy plover among other species are listed. Flood control is a major interest of private landowners within the river basin.

In 1995, the Santa Ynez Watershed Enhancement and Management Plan was initiated by federal, state, and local government agencies in an attempt to resolve some of the conflicts within the watershed. The Land Trust for Santa Barbara County was designated as the neutral facilitator and mediator for the planning process. The goal of the planning process was to have ''all'' river ''participants'' actively participate in all stages of planning for the long-term management and restoration of the river. This goal led to the creation of a diverse steering committee.

From the outset, the planning process was a highly contentious one; debates over what the ultimate goals and objectives of the plan should be, who should participate on the steering committee, and what the involvement of government agencies should be have erupted and stalled the process. In 1996, members of a coalition of private property owners, ranchers, and farmers (lead by a member of the Coalition of Labor, Agriculture and Business or COLAB) were successful in breaking up the watershed planning effort. The coalition of property owners and user groups preferred flood control to habitat restoration. Because of the focus on flood control and the conflict over various interests within the watershed steering committee, local, state, and federal agencies ultimately withdrew their funds from the planning effort. Even with a hired facilitator, the organization was unsuccessful in reconciling the conflict over the scope of the watershed planning effort. One problem that has yet been resolved is

the division between the suburban southern part of Santa Barbara county and the more rural northern part of the county whose residents live along the river.

The Yakima River

The Yakima River drains much of south-central Washington before emptying into the Columbia River. The upper basin is national forest land, while the Yakama Indian Reservation occupies much of the basin west of the river and below the city of Yakima. In response to persistent drought, which helped create significant water shortages in the early 1990s, Yakima Basin irrigators and agricultural interests launched a watershed initiative. The watershed initiative came primarily from agricultural producers and processors, areas businessmen, and other concerned individuals. In 1994, the Yakima River Watershed Council was officially incorporated, and a diverse watershed council was created ''to integrate a broad spectrum of water-based interests in the three-county area, encompassed within the Yakima River Basin, into a consensus process for the purpose of sustaining a sufficient water supply for all stakeholders into the 21st century'' (Yakima River Watershed Council undated). The council has more than 1000 members, including the Yakama Indian Nation.

The council's mission is ''to develop and implement, through consensus, a plan to provide consistent and adequate water to meet all economic, cultural, and environmental needs'' in the basin. To date, the council has identified a number of goals, such as conservation, storage, and watershed restoration, but it is fundamentally interested in acquiring streamflow data. The council proposes that natural resources should be developed, but ''development should be balanced and prudent, with precautions taken to ensure sustainability'' (Yakima River Watershed Council undated).

To deal with conflict between goals and objectives, the council established a number of technical committees and task forces that are responsible for planning. With a number of committees and subcommittees, the council has emerged as an important social network within the basin and has fostered decentralized and interdependent relationships and partnerships. The council has not hired a facilitator or mediator, but, rather, has developed an organizational structure and culture conducive to cooperation.

Survey of Watershed Organization Members

An important element of this research was a survey of participants active in these watershed organizations. The purpose of the survey is to illustrate the diverse and shared values held among members of watershed organizations. In 1996, two rounds of a survey questionnaire were mailed to a random sample of 425 individuals whose names appeared on mailing lists of the watershed organizations. We received 221 completed surveys for a response rate of 52% [higher than expected (Bruvld and Comer 1988)]. The respondents included private property owners, scientists, and representatives from resource agencies, environmental organizations, and industry. The survey was intended to provide information about participants' values and their perception of the planning process. Questions were intended to evaluate the degree of attachment to ecological values (following Olsen and others 1992, O'Riordan 1995, among others), as well as questions focused on a respondent's assessment of the quality of available scientific information and the nature of agreement/disagreement in their watershed.

A fundamental question of great interest has to do with the nature and structure of divisions among our respondents. Based on the scholarly literature on environmental world views, we hypothesized that there would be at least two primary ''value'' orientations that would exist separately (e.g., Olsen and others 1992). One orientation would involve attachment to ecological values, that is, a commitment to valuing nature for its own sake rather than merely for its use and recreational value. This is the essential notion of what has come to be widely called ''ecocentrism'' or the ''new environmental paradigm'' (Olsen and others 1992). A second, distinct dimension would involve the respondent's degree of faith in or attachment to science and technology as a source of solutions to problems in nature. This orientation has been referred to as ''technocentrism'' (O'Riordan 1995). By hypothesizing these as separate dimensions, we entertained the possibility that faith in science and technology could be independent of attachment to ecological values although, it would by no means be surprising to find a strong attachment to nature accompanied by a faith that science provides solutions to restoration problems or to find a hostility to science accompanying a hostility to ecocentric views.

We also hypothesized a dimension of concern or sensitivity to property rights. We suspected that sensitivity to property rights might load negatively as a dimension of values that included ecocentric values.

Moreover, we expected that participants would have views of the adequacy or completeness of scientific information that were distinct and separable from their attachment to values. That is, there would be no systematic and regular relationship between a respondent's agreement with values statements and their

assessment of the sufficiency of scientific information about the watershed.

A Discourse Analysis

To explore these issues further, we undertook a factor analysis of the 221 responses to the personal attitude questions in the survey. Factor analysis used in this way can be thought of as asking what underlying but unobserved variables can be used to account for the observed variation in the respondent samples. In the results reported here, implemented in SAS, the factors were extracted using unweighted least-squares factor analysis, and factors were subsequently rotated using the varimax criterion.[3] Experimentation with other extraction methods (including iterated principle components) and other rotation methods produced such similar results that we have considerable confidence in these results as a description of the data.

As reported in Table 1, we extracted five factors (what we refer to as discourses). The number of factors was determined based on various criteria, including ''eigenvalues greater than 1,'' examination of a scree plot, and evaluation of the substantive coherence of the resulting variables.[4] The five factors account for 39% of the total variation.

The factors extracted generally confirm our expectations about the dimensions underlying the views of watershed participants. The first factor we have labeled ''ecocentrism.''[5] The two items loading most heavily on this factor are the statements: ''Nature should be preserved for its own sake''; and ''nature contains its own purpose which should be respected as a matter of ethical principal.'' Basically we believe this factor taps an underlying commitment to the idea of a natural world as being intrinsically valuable.

The second factor, labeled ''scientific agreement,'' involves respondent evaluations of the state of agreement among scientists. The statements that load on factor 2 do not include much of a normative dimension. Rather, they involve characterization of the degree of scientific agreement. This is readily apparent from the two statements that load most heavily: ''Scientists involved in [watershed project name] have reached agreement on findings on the health of the river''; and ''Scientists involved in [watershed project name] have reached agreement on methodologies to be used in restoration.'' As the other items involved in this factor suggest, the factor involves not just issues of scientific adequacy, but also an element of the general level of organizational cooperation.

We have labeled the third factor ''local control.'' The local control factor reveals the normative complexity and subtlety arising in matters of restoration. This factor involves questions of politics and the balancing of needs and values. The items loading most heavily deal with the importance of citizen influence, and local level control of policies. Also loading here, however, are items that have traditionally been characterized as technocentric: that the environment should be changed to meet people's needs, and that balancing economic and environmental needs is a major restoration goal. Additionally interesting here is an item asking whether group cooperation is explained by the fact that participants ''face the same problem and share the same fate.''

These findings suggest that expressions of support for local democracy and citizen control are not systematically part of ecocentrism as a value dimension. Moreover, these findings suggest that to the extent that participants embrace the logic of local control, they tend to embrace what appears to be a separate dimension from ecocentrism per se, that is, whether nature, even though perhaps highly valued, should be traded off with other values, especially when doing so serves the interest of a local community.

The fourth factor, which we call preservationism, appears to reflect fairly extreme preservationist sentiments that go well beyond the reverential attitude toward the natural world evident in factor 1. Underlying this factor is a view of nature that once spoiled, it cannot be reclaimed. Thus, the statement ''I view my role as an advocate of environmental preservation'' does not load heavily on this factor (but rather loaded most strongly on factor 1) because this statement is much more generic than the values underlying factor 4. More radical preservationist sentiments appear in factor 4: ''there is no such thing as a restored nature,'' ''nature is best left alone,'' and ''there are no technologically proven ways to restore nature.'' Our interpretation is supported by the negative loading of the item ''mankind can do a great deal to assist nature in the healing process.'' As we will see below, there may be some ambiguity about this interpretation.

Finally, the fifth factor is a classic ''faith in science''

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[3]Varimax is an orthogonal rotation—that is, the resulting factors are by definition uncorrelated. Varimax rotation simplifies the column structure of the resulting factor matrix.

[4]Of the original 37 attitude items included in the survey, 33 were retained for the factor analysis. The other four (conflict, myths, waste, nocompro) were dropped because preliminary analysis showed that they loaded approximately evenly on (at least) three factors, and thus did not help in interpreting the underlying factors).

[5]The basic link to the scheme of Olsen and others (1992) is confirmed by the negative loading of the technocentric view that ''the environment should be changed to meet people's needs,'' which has its primary loading on factor 3.

Table 1. Factor analysis of responses from survey of river restorationists[a]

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	
Factor 1: Restorationist sentiment						
OWNSAKE	76	−7	−14	17	−10	nature should be preserved for its own sake
ECOPURP	67	−6	1	9	4	nature contains its own purpose
ECOINTEG	64	3	6	−7	−3	restoration should sustain ecological community
FUTURE	64	9	3	−12	0	natural resources should be preserved for future
ECOVALUE	53	14	0	4	−1	nature has value other than economic value
PRESERVE	48	11	−8	15	13	I advocate environmental preservation
TIME	42	13	−2	−15	14	time horizons for science must be longer
ECOASST	42	−2	11	−27	25	mankind can assist nature in healing process
SCIETHIC	37	10	13	5	8	restorationists face important ethical question
Factor 2: Scientific information						
SCIFIND	2	83	5	15	−1	scientists involved here agree on health of river
SCIMETH	10	75	5	7	9	scientists involved here agree on restoration methods
RSTAGREE	21	59	2	7	7	restorationists agree on technologies
TOGETHER	2	54	32	−9	−5	participants are able to work together
SCICOMM	−1	47	−2	25	26	there are formal channels for scientists to communicate results
WORK	41	44	3	4	15	restorationists work with scientific communities to address information needs
SCIINFO	11	41	−1	29	20	science and technologized information is available for good restoration decisions
Factor 3: Local interests						
LOCALCIT	7	−2	75	17	2	citizens should have most influence
LOCLEVEL	2	−5	64	30	−2	policies made at local level
BALANCE	4	19	63	−8	22	balance between environment and economic needs are major goal
ANTHO	−25	2	52	18	22	environment changed for people's needs
PROPRTS	3	16	48	7	8	private property rights are key considerations
SAMEFATE	19	4	43	−8	16	participants share same fate
EFFICNCY	−19	−8	42	20	33	restore should be guided by efficiency
Factor 4: Preservation						
NONATURE	−11	4	18	65	2	no such thing as restored nature
ECOALONE	29	3	0	60	−8	nature is best left alone
SUFFUND	−18	29	7	55	7	sufficient funds to gen sci information for restoration
NOTECH	−3	15	17	47	0	no tech. proven ways to restore nature
RESTPOL	29	17	8	35	19	restoration lies not in science or technology but politics
PROPADV	22	−4	18	22	22	conflict between property rights advocates and restorationists is a formidable barrier to policy making
Factor 5: Faith in science and technology						
FAITH	0	12	15	−3	72	I have faith in science and tech to solve ecological problems
TECSOLVE	8	8	18	3	52	technology can solve most resto probs
TECHSOL	38	10	4	−19	47	technology and science can offer solutions to restoration
CENTRAL	7	16	15	16	33	only central authority deal with restoration
Variance explained by each factor	3.64	2.82	2.58	2.11	1.72	
Squared Multiple Correlations of the Variables with each Factor	0.86	0.85	0.8	0.76	0.72	

[a]Factors extracted by unweighted least squares. Rotated factor pattern—varimax rotation.

factor. This factor is one of three we had hypothesized. One item in particular is associated with the underlying factor—''I have an abiding faith in science and technology to solve complex ecological problems and restore our environment.'' It is worth noting that this factor is distinct from factor 2, ''scientific agreement,'' because it involves the respondent's own beliefs about what science and technology can accomplish, not his assessment of the degree of consensus among expert participants in his own organization.

Discussion

One of the implications of this analysis is that we should not think of disagreement within watershed organizations as involving just one single, dominant discourse. For example, there is no simple division between defenders of nature and proponents of property rights. In fact, one of the interesting findings of this analysis is that of the two items involving the term ''property rights,'' one basically does not load on any of the factors (''The conflict between property rights advocates and restorationists is a formidable barrier to policy making''), and the other loads only moderately on factor 3 (local control). In short, while some of the most visible rhetoric and significant litigation is focused on property rights, property rights does not emerge as a basic underlying organizing variable.

Our results suggest that there are alternative discourses that can coexist in almost any combination, involving ecocentrism (respect for nature), local control (deference to vested interests), preservationism (irreversible loss of nature), and faith in science. While this makes for potential complexity in the discourse of watershed participants, it also may increase the potential for developing a sense of common ground and understanding.

Our survey results show that a small number of dimensions appear to organize the value orientations of watershed planners. However, there does not appear to be a single dominant ecocentric–technocentric dimension. Rather, there are varying degrees of agreement with different sentiments including ecocentrism, concern for local control, appraisal of the state of scientific knowledge, preservationism, and faith in science. This suggests that debate about scientific issues is not the only dimension of disagreement and quite likely not the most important one within watershed organizing and planning.

To the extent that we can illuminate the issue with these data, it appears that there are relatively few large differences between the respondents in the different watershed organizations. Although the biological conditions of the watersheds are very different, the objective degree of scientific knowledge is great in the different watersheds (Woolley and McGinnis (in press). While there were differences between the watershed organizations, the critical point is that the successful cases (the upper Sacramento and the Yakima) are not distinguishable from the unsuccessful (the Santa Ynez)—at least not in terms of the loadings on the basic factors. A straightforward way of testing this was simply to include the variable ''Santa Ynez'' in the same factor analysis reported here—this being the binary variable taking the value 1 when a respondent was involved in the Santa Ynez project. This variable loads weakly on several factors and has no strong loading on any factor. Consistent with our analysis of the factors, such weak holdings are essentially uninformative about the underlying factor. Thus, the failed watershed project does not appear to be distinctive in terms of the basic concerns and values of respondents to our survey. This means that, for the most part, success or failure does not arise from the issues confronted in watershed planning, or in the patterns of interests per se, but rather in the processes of decision making and in the way issues and concerns have been framed in particular settings or situations.

Concluding Thoughts

We conclude from our case studies, in conjunction with our surveys, that the source or path of the watershed initiative is important. The value is shown of having a local, community-based initiative followed by the incorporation of other participants that may include the state and federal government. This was not the case of the Santa Ynez, which was created by federal, state, and local governments. Moreover, our research shows that it does not appear to be the case that scientific consensus (i.e., the use of joint fact-finding procedures) itself is a major impediment to cooperation. The lack of a sense of community may be the single most important barrier to successful long-term watershed planning.

While alternative dispute resolution processes imply an absence of shared values, our surveys show that there exist clear discourses or shared value-based orientation among survey respondents. The use of collaborative and conflict resolution strategies may be helpful to resolve value-based conflict, but adoption of these strategies is not enough. One alternative is to focus on shared and common agreements within a watershed organization.

We propose three values of watershed planning that are often overlooked by environmental managers. First, the value of community-oriented planning and partner-

ship building. A community offers a system of shared service and social identification within the context of a watershed system. Rather than focusing on disagreements, the shared discourses and value-based orientations that we described in this essay are good starting points to rebuild a sense of community within a watershed. Indeed, the great value of watershed planning is that it may cause society to confront our own limitations, to initiate community-based responses based on shared values about nature, science, technology, and participation. Rebuilding communities at the watershed level will be a perilous and difficult endeavor, in which we encounter tensions that cannot be avoided or perhaps reconciled. These tensions are inherent in the experience of watershed planning and community rebuilding. While federal resources are needed to encourage and enhance watershed-based planning efforts (Rieke and Keeney 1997), government alone cannot restore a watershed. The burden of restoration rests on the members of a community. A bottom-up approach to watershed planning that evolves out of particular local communities and regions is more likely to be successful in the long-term or across generations than a top-down approach.

Second, the establishment of social networks and building relationships is key to long-term watershed planning. Most watershed organizations do not have the necessary administrative or technical resources. Participants in community-oriented watershed planning efforts may be members of social networks that can provide access to these resources and public forums for discussion and relationship building. For example, in the Pacific Northwest, the Watershed Information Network (WIN) in Humbolt, California, has provided administrative and technical support to over 150 groups in the bioregion. In addition, WIN has provided a public forum for diverse members of communities to express their views, collaborate, and negotiate agreements that support watershed restoration and enhancement (Sungnome Madrone, WIN, 1 June, 1998, personal communication). Such a role has also been provided by the Spring-Run Chinook Workgroup and the Yakima River Council. These social networks inevitably lead watershed organizations away from the popular political abstractions that have come to describe the tensions between an economic or ecological interpretation of the world into shared strategies for the rebuilding of enduring place-based community.

Third, watershed planning should build on agreements and not focus on the inevitable disagreements and conflict. Watershed planning is not a solitary experience, but, instead, lends itself to hopeful commitment to community. The initiation of community-based watershed planning combines the tools of science and technology with the social skill and hard work of people. Relearning lost community values and social skills are two facets of watershed organization and planning (Aberley 1998, McGinnis 1998). Learning how to deal with conflict is important. Better yet, learning what a community shares and has in common is the ultimate lesson of watershed planning and organizing. The poet and watershed activist Gary Snyder (1995) believes the development of a ''watershed consciousness'' is one key element in long-term community-based watershed effort. As Snyder (1995, p. 235) writes:

> Watershed consciousness and bioregionalism is not just environmentalism, not just a means toward resolution of social and economic problems, but a move toward resolving both nature and society with the practice of a profound citizenship in both the natural and social worlds.

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