# Watershed Partnerships in California & Washington:

*Final Report for the Watershed Partnerships Project*

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**Disclaimer**

Although the research described in this article has been funded in part by the United States Environmental Protection Agency through grant #827145 to the University of California, Davis, it has not been subjected to the Agency's required peer and policy review and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred.

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# Contents

# 1. INTRODUCTION

This report documents the achievements of the Watershed Partnerships Project (WPP) at the University of California, Davis as of January 2002. Funding for the WPP is provided by three sources:

- EPA/NSF Water & Watersheds STAR program. Grant # 827145. January 1999 through December 2000. $149,934.32
- NSF Program in Decision, Risk, and Management Science. Grant # 9815471. October 1, 1998 through September 30, 2000. $150,682.97
- David and Lucile Packard Foundation, Conserving California's Landscapes Program, July 2000 through June 2002. $200,000.

Between the three grants we received $500,000, somewhat more than the $424,891 we had originally requested from EPA Water & Watersheds. We have treated the three grants as a composite project— the UC Davis Watershed Partnerships Project—and this report is written for the composite project.

**Project Goals and Objectives**

Given the limitations of command-and-control regulation by federal and state bureaucracies, stakeholder-based planning and management has become an increasingly popular strategy nationwide for resolving local environmental conflicts. The primary goal of the WPP is to understand the factors affecting the ability of partnerships to resolve resource management controversies within the watershed and then to implement those decisions through restoration projects or other means. In the original proposal, we identified five related objectives, reprinted below.

1. To use established scientific methods—including explicit theoretical assumptions and intersubjectively-reliable methods of data acquisition and analysis—to improve our understanding of the factors affecting the ability of stakeholder negotiating processes to reach formal agreements and to implement those agreements.
2. To ascertain whether consensus-based negotiating processes have been more successful than other approaches in developing and implementing concrete projects. We also wish to explore their ability to achieve desired environmental and economic outcomes.
3. To compare the strengths and weaknesses of the three theoretical frameworks in explaining both the conditions under which stakeholder negotiations will be successful and their relative success in actually implementing restoration and monitoring projects. The three frameworks are (a) Elinor Ostrom's Institutional Analysis and Development (IAD) framework for the management of common property resources, (b) Sabatier and Jenkins-Smith's Advocacy Coalition Framework (ACF) of policy change, and (c) a framework for understanding the role that social capital plays in solving collective action problems, based on the work of Robert Putnam, James Coleman, and others. We intend to look at the same phenomena through multiple theoretical lenses (Platt, 1964; Stinchcombe, 1968; Allison 1971).
4. To provide concrete guidance to agency managers about how they might assist local partnerships, and how to decide when to support partnerships and when to simply leave them alone. Collaborators responsible for allocating restoration and bond monies in California already use the UC Davis watershed groups and projects databases underlying this proposal, and plan to take advantage of our results to improve evaluation of future stakeholder-driven proposals.
5. To identify which watershed characteristics are most amenable to rehabilitation.

## Methods

The original grants envisaged doing case studies of a random sample of 100 partnerships (70 in California, 30 in Washington), each involving a diverse array of stakeholders who are interested in watershed restoration and management. The WPP will ultimately include 80 case studies (50 CA, 30 WA) rather than 100, as each case study proved to be considerable more labor intensive than we had anticipated.[1] This report includes results from the first 44 to 50 partnerships studied. Thirty additional cases are in progress, and will be completed by September 2002.

The field research began with an effort to identify all partnerships in California that were active at any point between 1995 and 1999, including partnerships that are now defunct.[2] To be included in the sampling frame, a partnership needed to meet at least four times per year, and needed to focus on managing one or more streams, rivers, or watersheds. To insure an adequate diversity of stakeholders, each partnership needed to include: 1) at least one state or federal official; 2) at least one representative of local government—either a general-purpose city or county, or a special district (such as water or school district); and 3) at least two opposing interests, such as a resource user and either a regulating agency or environmentalist.

Our search revealed a population of 150 partnerships in California, from which 50 were randomly sampled with geographic stratification, such that no more than two partnerships were selected from a single watershed (Table 1).[3] In Washington, we randomly selected 20 watersheds, and sampled 1-2 partnerships from each.[4] Because the selection process was random and the sample size is relatively large, the overall results should be representative of watershed partnerships in the two states.

The sample includes ten partnerships that had disbanded by the time of our study. Three of these disbanded because they achieved their main objectives. The other seven disbanded after their negotiations ended in stalemate.

For each selected partnership, we (1) interviewed three to six key participants, (2) analyzed relevant documents such as watershed plans and meeting minutes, and (3) mailed a survey to all participants sufficiently knowledgeable about the partnership to complete at least part of the questionnaire, plus several knowledgeable non-participant observers.

The three to six interviewees were selected to represent all the major factions within the partnership. This included at minimum the partnership's coordinator plus one key participant from a pro-environment perspective and one participant from a pro-development perspective.

For the survey, the names of the participants and knowledgeable observers

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[1] We underestimated the time required to conduct the interviews, transcribe them, solicit comments from interviewees, and then code the information from the interviews and other materials into a integrated portrait of the partnership involving approximately 400 variables. The interviews have averaged about 90 minutes, rather than the 45 originally envisaged. And the coding frame for the partnership—which incorporates information from the interviews and relevant documents—took much longer to develop than we had planned.

[2] California partnerships were identified through several means. First, a brief questionnaire was mailed to a random sample of District Conservationists with the Natural Resources Conservation Service, directors from local Resource Conservation Districts, field personnel of the California Department of Forestry and Fire Protection, and University of California Cooperative Extension specialists. Second, we searched the Natural Resource Projects Inventory, a database housed in the UC Davis Information Center for the Environment. Third, we used Internet search-engines to find relevant web pages. Fourth, we asked interviewees from each partnership to name other partnerships in their region. Finally, in cases where there was any doubt about whether a suspected partnership satisfied our operational definition, we called a partnership representative to obtain further information. A similar process was used for Washington.

[3] We partitioned California using Hydrologic Unit Code (HUC) watersheds defined by the United States Geological Survey. There are 160 HUCs in the state, ranging from 35 to 9000 square miles.

[4] We partitioned Washington using the 62 Water Resource Inventory Areas, which range from 140 to 3000 square miles.

were obtained during the interviews. The smallest partnership had six survey recipients, and the largest had 76. The resulting data set[5] includes 182 interviews and 920 surveys (out of 1421, for a response rate of 65%). Response rates for individual partnerships ranged from 45% to 88%.[6]

**TABLE 1.** Partnerships studied to date.

| | |
|---|---|
| California (n = 39) | |
| Alameda Ck Watershed Mngmnt Program Steering Com. | Pescadero-Butano Creek CRMP |
| American River Watershed Group | Pine Creek CRMP |
| Butte Creek Watershed Conservancy | Russian River Watershed Council |
| Cache Creek Stakeholders Group | San Francisquito Creek CRMP |
| Central Sierra Watershed Committee | San Joaquin River Management Program |
| Cosumnes River Task Force CRMP | San Joaquin Valley Resource Conservation Partnership |
| Dos Palmas Cooperative Mangement Committee | San Juan Creek Feasibility Study Management Team |
| Dry Creek CRMP | Santa Ana River Watershed Group |
| Eel River Watershed Improvement Group | SB1086 Sacramento R. Fisheries & Habitat Restoration |
| Garcia River Watershed Advisory Group | Scott River Watershed Council |
| Goose Lake Fishes Working Group | Shasta-Tehama Bioregional Council |
| Klamath River Fisheries Task Force | Smithneck Creek CRMP |
| Los Angeles & San Gabriel Rivers Watershed Council | Sonoma Marin Animal Waste Committee |
| Lower Stony Creek Task Force and Technical Team | South Fork Dialogue |
| Marin Coastal Watershed Enhancement Project | South Fork Trinity River CRMP |
| Mokelumne River Watershed Group | Stanislaus Stakeholders |
| Navarro River Watershed Advisory Group | Tuolumne River TAC |
| Northern Klamath Bioregional Group | Watsonville Sloughs Water Resources Program |
| Oakhurst River Parkway Partnership | Yuba Watershed Council |
| Panoche/Silver Creek CRMP | |
| Washington (n = 11) | |
| Cedar River Council | Jefferson County Water Resources Council |
| Clean Water District | Padilla Bay Farm Committee |
| Douglas County Watershed Planning Association | Skagit IRC |
| Elwha-Morse Creek Watershed Management Team | Tolt Fish Habitat Restoration Group |
| Entiat Valley Landowners Association | Wenatchee WAPIC |
| Hood Canal WPC | |

[5] To avoid data-entry errors, all the data from the surveys and interviews were entered twice, and any discrepancies between the two rounds were corrected before analyzing the data.

[6] Both the semi-structured interviews and the questionnaire were designed to collect information needed to test various theory-driven hypotheses, and to address other issues recommended by our 20-member advisory committee, which consisted of representatives from watershed-related agencies and interest groups. To ensure that the questionnaire reflected issues and terminology relevant to a typical partnership, the questionnaire was not finalized and distributed until several dozen interviews had been completed. The interview script and questionnaires were essentially the same for each partnership, although the cover art and language of the questionnaires were cosmetically tailored to reflect each partnership's name and location.

# 2. PARTNERSHIP STRUCTURE AND FUNCTION

**Motives and attitudes regarding collaboration**

For the statistically average partnership, 2% of the participants represent a Native American tribe, 15% are from federal agencies, 16% from state agencies, 24% from local agencies, 2% are local elected officials, 16% are private-sector resource users, 13% are environmentalists or outdoor recreation advocates, 7% are freelance facilitators, technical consultants, or university researchers, and 3% are unaffiliated watershed residents.

In terms of demographics (Table 2), the median age is 50 years, only 28% are female, and 85% have a bachelor's degree. Slightly more than half the participants live outside the watershed, and the median participant spends 7.5 hours per month doing work directly related to the partnership. For resource users and environmentalists, this time is very likely to be uncompensated, whereas agency officials typically participate on "company time." On the other hand, traveling to partnership meetings takes twice as long (60 minutes) for state and federal officials, as they are much less likely to reside in the watershed.

**TABLE 2.** Demographics and transaction costs

| | Native Amer. Tribes | Federal & state agencies | Local agencies | Resource users | Environmentalists | Consultants & academics | F-Ratio | P-Level |
|---|---|---|---|---|---|---|---|---|
| Female | 20% | 26% | 25% | 27% | 32% | 31% | 7.6 | .00 |
| Age (median) | 39 | 47 | 49 | 52 | 52 | 49 | 7.6 | .00 |
| College graduates | 72% | 93% | 85% | 72% | 83% | 93% | 4.8 | .00 |
| Live in the watershed | 58% | 28% | 55% | 74% | 75% | 35% | 24 | .00 |
| Years living in the watershed (median) | 15 | 17 | 22 | 40 | 20 | 12 | 18 | .00 |
| Hours per month spent on partnership activities (median) | 5.5 | 8.0 | 6.0 | 6.0 | 8.0 | 10.0 | 15 | .00 |
| "When you spend time on the partnership, is it on 'company time' or your own time?"[1] | 1.7 | 2.1 | 2.8 | 5.2 | 5.3 | 3.9 | 53 | .00 |
| How long it takes to travel to each meeting (median minutes) | 22 | 60 | 40 | 30 | 30 | 45 | 6.2 | .00 |

[1] Mean response. Metric: 1 = all company time; 7 = all own time

With a few notable exceptions, motives for participating are comparable across the various categories of stake-holders (Table 3). The primary motivation for all categories is, quite nobly, "to improve the watershed." Relatively few stakeholders identified social or professional networking as an important motive. Compared to other stakeholders within a given partne-rship, resource users tend to participate defensively, in terms of protecting their financial interests, and seeking to "prevent the partnership from achieving undesirable changes in law or policy."

Stakeholders tend to be very supportive of a collaborative approach to policymaking, when juxtaposed with three alternatives (Table 4). All categories of stakeholders agreed most strongly with the statement "The best strategies for resolving watershed issues involve consensus-based processes." Resource users were nearly as supportive, on average, of "allowing private property owners to manage their land as they see fit." Federal and state agencies and environmentalists were slightly supportive of "reliance on each agency's legal mandate and court review." No category of stakeholder was supportive, on average, of "reliance on tradable permits for water, fish catch, development, etc."

Perceptions of partnership success also vary among the stakeholder categories (Table 5). The most positive perceptions of success are held by state and federal agencies, along with consultants/academics. Resource users and Native Americans have the most negative perceptions. Resource users and Native Americans also have the most extreme opinions, on average, regarding environmental ideology, with Native Americans being the most environmental (Table 6). There is relatively little variation across stakeholder categories on trust (Table 7). At the individual level, there is a high correlation between trust and perceived success (Table 8).

**TABLE 3.** Reasons for participating in the partnership[1]

| | Native Amer. Tribes | Federal & state agencies | Local agencies | Resource users | Environmentalists | Consultants & academics | F-Ratio | P-Level |
|---|---|---|---|---|---|---|---|---|
| To improve the watershed | 6.8 | 6.5 | 6.0 | 5.6 | 6.8 | 6.5 | 17 | .00 |
| To protect my financial interest | 1.7 | 1.4 | 2.5 | 5.0 | 1.7 | 1.9 | 71 | .00 |
| To achieve my organization's goals and objectives | 5.8 | 5.8 | 5.7 | 4.9 | 5.7 | 4.5 | 8.0 | .00 |
| To prevent the partnership from achieving undesirable changes in law or policy | 3.8 | 2.9 | 3.8 | 5.4 | 4.0 | 3.1 | 23 | .00 |
| To head off state/fed regulation | 1.5 | 2.4 | 3.7 | 5.1 | 2.0 | 2.6 | 45 | .00 |
| To educate myself about watershed issues | 2.9 | 4.5 | 4.9 | 5.4 | 5.5 | 5.1 | 8.2 | .00 |
| To meet people | 1.6 | 3.0 | 2.8 | 2.9 | 3.1 | 3.7 | 2.5 | .03 |

[1] Means. Metric: 1 = not an important reason; 7 = very important reason

**TABLE 4.** "The best strategies for resolving watershed issues include…"[1]

| | Native Amer. Tribes | Federal & state agencies | Local agencies | Resource users | Environmentalists | Consultants & academics | F-Ratio | P-Level |
|---|---|---|---|---|---|---|---|---|
| …consensus-based negotiations | 5.5 | 6.1 | 5.9 | 4.9 | 5.9 | 5.9 | 11 | .00 |
| …reliance on legal mandate and court review. | 4.5 | 3.7 | 3.2 | 2.5 | 4.2 | 3.8 | 15 | .00 |
| …reliance on tradable permits | 2.4 | 3.2 | 3.2 | 3.2 | 2.5 | 3.4 | 4 | .00 |
| …allowing private property owners to manage their lands as they see fit | 1.9 | 2.8 | 3.1 | 4.8 | 1.7 | 2.6 | 41 | .00 |

[1] Means. Metric: 1 = strongly disagree; 7 = strongly agree

**TABLE 5.** Perceptions of partnership success

| | Native Amer. Tribes | Federal & state agencies | Local agencies | Resource users | Environmentalists | Consultants & academics | F-Ratio | P-Level |
|---|---|---|---|---|---|---|---|---|
| Perceived impact of the partnership on watershed conditions[1] | 0.2 | 0.6 | 0.3 | -0.1 | 0.4 | 0.6 | 18 | .00 |
| Social capacity building[2] | 4.2 | 5.1 | 4.9 | 4.7 | 5.0 | 5.5 | 3.8 | .00 |
| Achieving partnership goals[3] | 3.4 | 4.5 | 4.2 | 3.8 | 3.8 | 4.3 | 2.8 | .02 |

[1] *Perceived Impact on Watershed Conditions* index calculated as mean of perceived effect on 12 problems areas (e.g. threats to species or habitat, lack of economic prosperity, etc.) with each problem weighted by amounts of perceived seriousness.

Means. Metric: -3 = made much worse; 0 = no net impact; +3 = made much better

[2] *Social Capacity Building* index calculated by the mean of 3 survey questions. (alpha = 0.75)

"The partnership has give me…"

a) new long-term friendships and/or professional relationships. (r = 0.82)
b) a better understanding of other stakeholders' perspectives. (r = 0.84)
c) a better understanding of the physical or biological processes in the watershed. (r = 0.79)

Means. Metric: 1 = strongly disagree; 7 = strongly agree

[3] "The partnership has achieved most of its goals and objectives."

Means. Metric: 1 = strongly disagree; 7 = strongly agree

**TABLE 6.** Ideology.

| | Native Amer. Tribes | Federal & state agencies | Local agencies | Resource users | Environmentalists | Consultants & academics | F-Ratio | P-Level |
|---|---|---|---|---|---|---|---|---|
| Environmental conservatism[1] | 1.8 | 2.9 | 3.3 | 4.4 | 2.2 | 2.5 | 54 | .00 |
| Perceived impact on the partnership from recent listings of salmon and steelhead species for protection under the Endangered Species Act.[2] | 1.4 | 0.8 | 0.3 | -0.1 | 1.6 | 1.0 | 15 | .00 |

[1] Environmental Conservatism index calculated by the mean of 8 survey questions. (alpha = 0.87)

Q 1. Political system should protect private property. (r = 0.78)
Q 2. Habitat protection must pass benefit cost criterion. (r = 0.78)
Q 3. Laws and regulations should ensure business prosperity. (r = 0.79)
Q 4. Plant and animals intended for human use. (r = 0.75)
Q 5. Government planning leads to loss in freedom. (r = 0.75)
Q 6. Best Government is least intrusive. (r = 0.72)
Q 7. People were intended to rule over the rest of nature. (r = 0.70)
Q 8. Development decisions are best left to the market. (r = 0.64)

Means. Metric: 1 = strongly anti-conservative; 7 = strongly conservative

[2] Means. Metric: -3 = very negative impact; 0 = no net impact; +3 = very positive impact

**TABLE 7.** Trust in people and process

| | Native Amer. Tribes | Federal & state agencies | Local agencies | Resource users | Environmentalists | Consultants & academics | F-Ratio | P-Level |
|---|---|---|---|---|---|---|---|---|
| Trust in people[1] | 5.0 | 5.3 | 5.2 | 4.8 | 4.9 | 5.3 | 7.7 | .00 |
| Trust in process[2] | 4.8 | 5.1 | 5.2 | 4.5 | 4.7 | 5.3 | 6.6 | .00 |

[1] *Trust in People* index calculated by the mean of 5 survey questions. (alpha = 0.88)
How many of the participants…

a) are honest, forthright, and true to their word? (r = .807)
b) have reasonable motives and concerns? (r = .799)
c) are willing to listen, and try to understand other points of view? (r = .870)
d) reciprocate acts of good will or generosity? (r = .840)
e) propose solutions compatible with the needs of the partnership? (r =.810)

Means. Metric: original 5-point scale re-scaled to 1 = none; 4 = half; 7 = all

[2] *Trust in Process* index calculated as the mean of 2 survey questions. (alpha = 0.78)
Q1. "The partnership process treats all parties fairly and consistently." (r = 0.91)
Q2. "The partnership's discussions are civil, marked by mutual recognition and respect." (r = 0.91)
Means. Metric: 1 = strongly disagree; 7 = strongly agree

**TABLE 8.** Spearman's correlations between measures of success and trust, with the number of observations in parentheses.

| | Perceived impact on watershed | Perceived impact on human & social capital | Perceived achievement of partnership goals | Trust in people | Trust in process |
|---|---|---|---|---|---|
| Perceived impact on watershed | 1.00 (866) | 0.42 (840) | 0.52 (810) | 0.51 (841) | 0.50 (831) |
| Perceived impact on human & social capital | 0.42 (840) | 1.00 (881) | 0.33 (835) | 0.43 (873) | 0.44 (869) |
| Perceived achievement of partnership goals | 0.52 (810) | 0.33 (835) | 1.00 (843) | 0.43 (832) | 0.44 (831) |
| Trust in people | 0.51 (841) | 0.43 (873) | 0.43 (832) | 1.00 (883) | 0.65 (866) |
| Trust in process | 0.50 (831) | 0.44 (869) | 0.44 (831) | 0.65 (866) | 1.00 (873) |

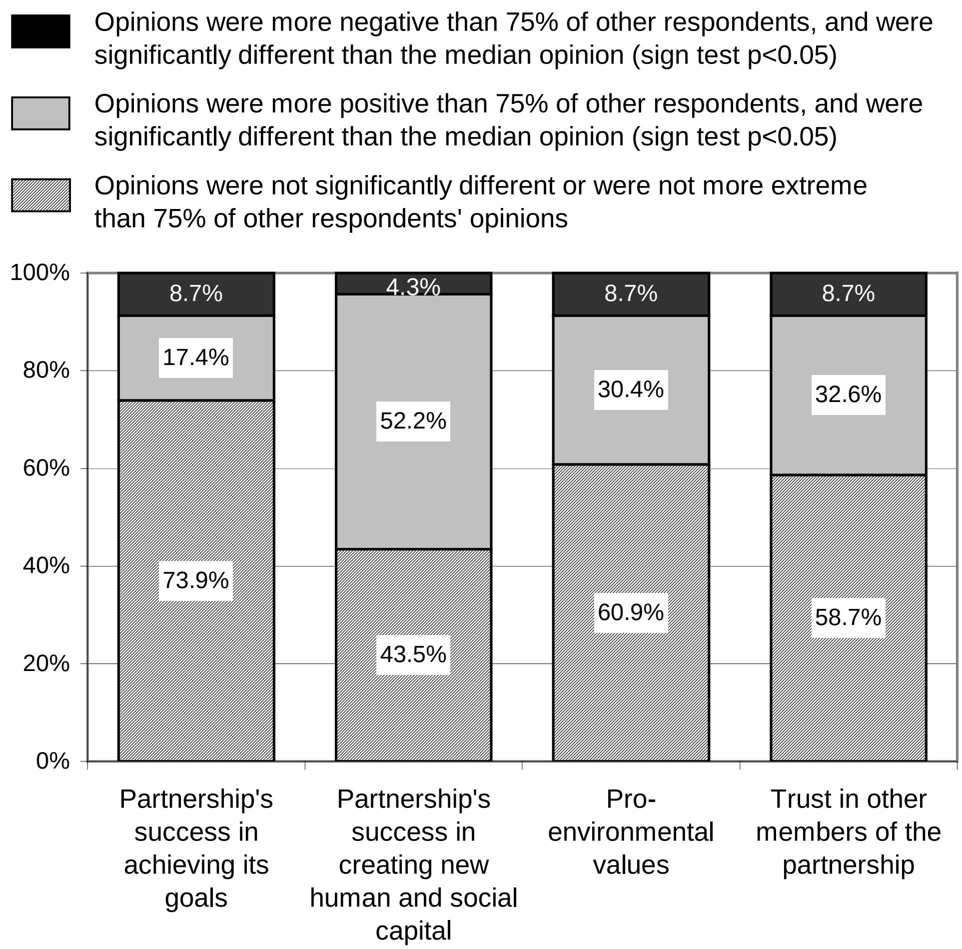



**FIGURE 1** Percent of coordinators (n = 46) whose opinions on four selected issues were significantly and substantially different than the opinions of other respondents from their own partnership (n = 35).

Examining only the coordinators and facilitators of each partnership (a subset of the consultants/academics category), led us to an important methodological finding. Most published surveys of watershed groups rely upon information provided by only 1-3 participants—usually the designated group coordinators and facilitators (for example, Cook 2000; Natural Resources Law Center 1996; Yaffee et al. 1996; Huntington and Sommarstrom 1999; McGinnis and Woolley 2000; Gordon and Jones 1998; Rieke & Kenney 1997; Wondolleck & Yaffee 1994). However we find that, in 26%-56% of partnerships, surveying only the coordinator would have resulted in an inaccurate estimate of the perceptions of the average respondent (Figure 1).

For example, 26% of coordinators gave an outlying response when asked to evaluate their partnership's success in achieving its goals. An outlying response is defined as one that is both (1) significantly different than the median response (sign test p<0.05), and (2) in the top or bottom quartile of responses from one's partnership. These outlying coordinators were nearly twice as likely to overestimate success as they were to underestimate success, relative to the median evaluation. When evaluating their partnership's success in generating new human and social capital, 56% of coordinators gave outlying responses, and 12 of these outliers overestimated success for every one who underestimated success, relative to the median response.

When expressing their environmental ideology or their trust in other members of the partnership, nearly one in three coordinators gave outlying responses, and the unusually trusting or environmentally-minded coordinators outnumbered the distrusting or conservative coordinators 3-to-1. Studies based on interviews or surveys of the partnership coordinator alone will, on average, provide a portrait that is more generous regarding interpersonal trust and partnership accomplishments, and that reflects a pro-environmental perspective (Leach 2002).

**Which participants are most important or influential?**

We asked stakeholders to “indicate the three organizations/interests that are most important or influential regarding Partnership issues.” We also asked for “up to three organizations/interests that you have relied on most heavily for information or advice on issues important to the Partnership.” Figures 2a gives the raw results in terms of the proportion of respondents naming each of 43 categories of stakeholders. Figure 2b displays the results in terms six aggregate categories. To control for respondents who name their own category, Figure 2b displays the frequency each was category was mentioned alongside a tally of the number of respondents from each category.

Federal and state agencies are mentioned as being “important or influential” and reliable sources of “information or advice” more often than any of the other five categories of stakeholders. They also participate in higher numbers than any other category, though not significantly higher than local agencies. Moreover, the rate at which they are identified as being influential or good sources of information is disproportionately high relative to their participation rate. Together, these results suggest that watershed partnerships are not examples of decisionmaking authority being fully devolved to local public officials. Rather, federal and state agencies maintain a large amount of authority. Watershed partnerships are an example of collaboration and consensus-based decisionmaking among intergovernmental actors and private interests.

Figure 2b also indicates that resource users and environmentalists participate in roughly equal numbers, and that their influence within the partnership is roughly in proportion to their participation rates. The Sierra Club's former president Mike McCloskey (1996) has warned that community-based resource management leads to public policy dominated by the interests of local landowners, developers, and industries. However, we find no clear support for the notion that environmental concerns are not being adequately voiced within most partnerships.

**FIGURE 2a.** Percentage of respondents who named each specific stakeholder type/organization as being one of the three (a) most important sources of information, (b) most influential.

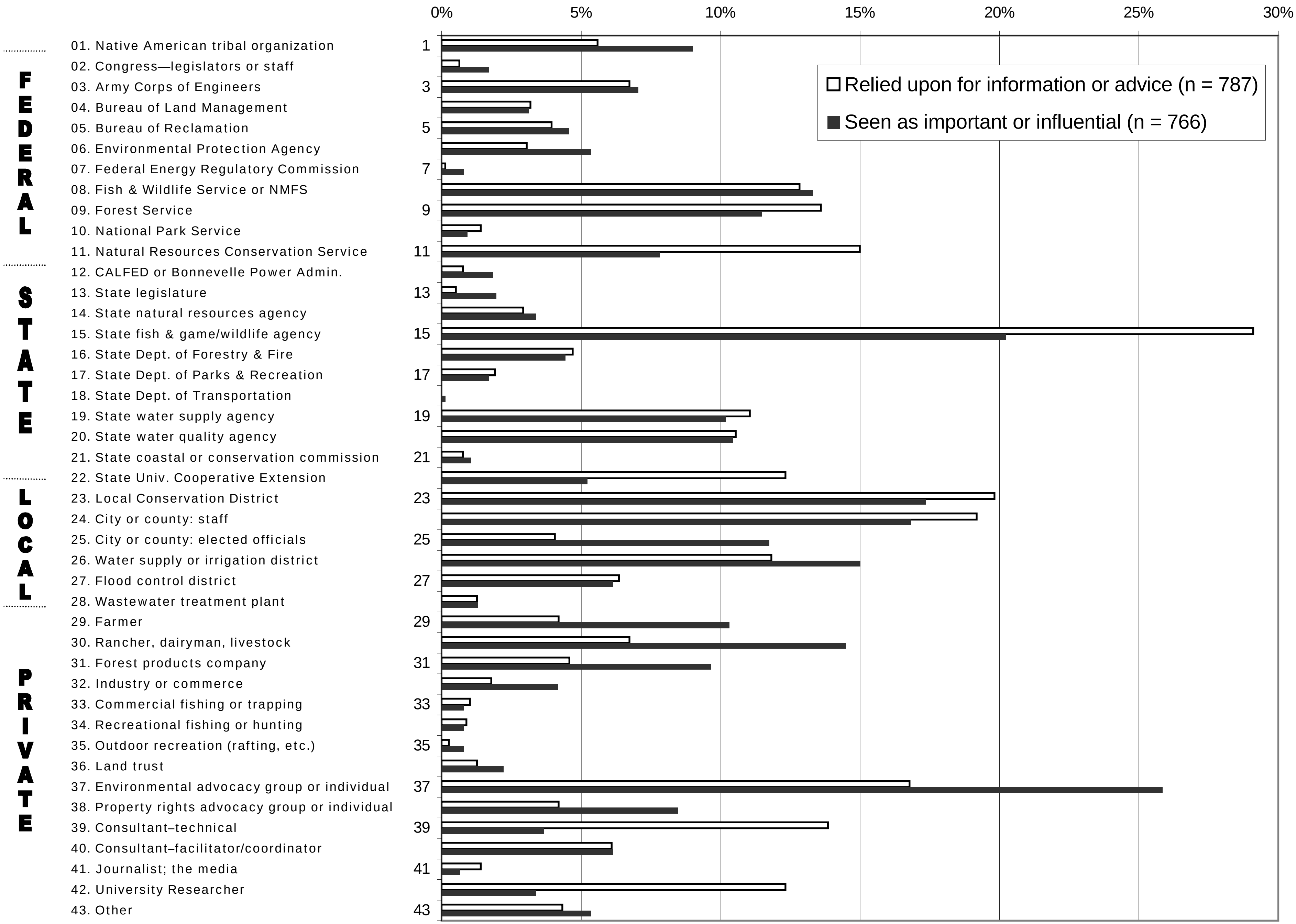
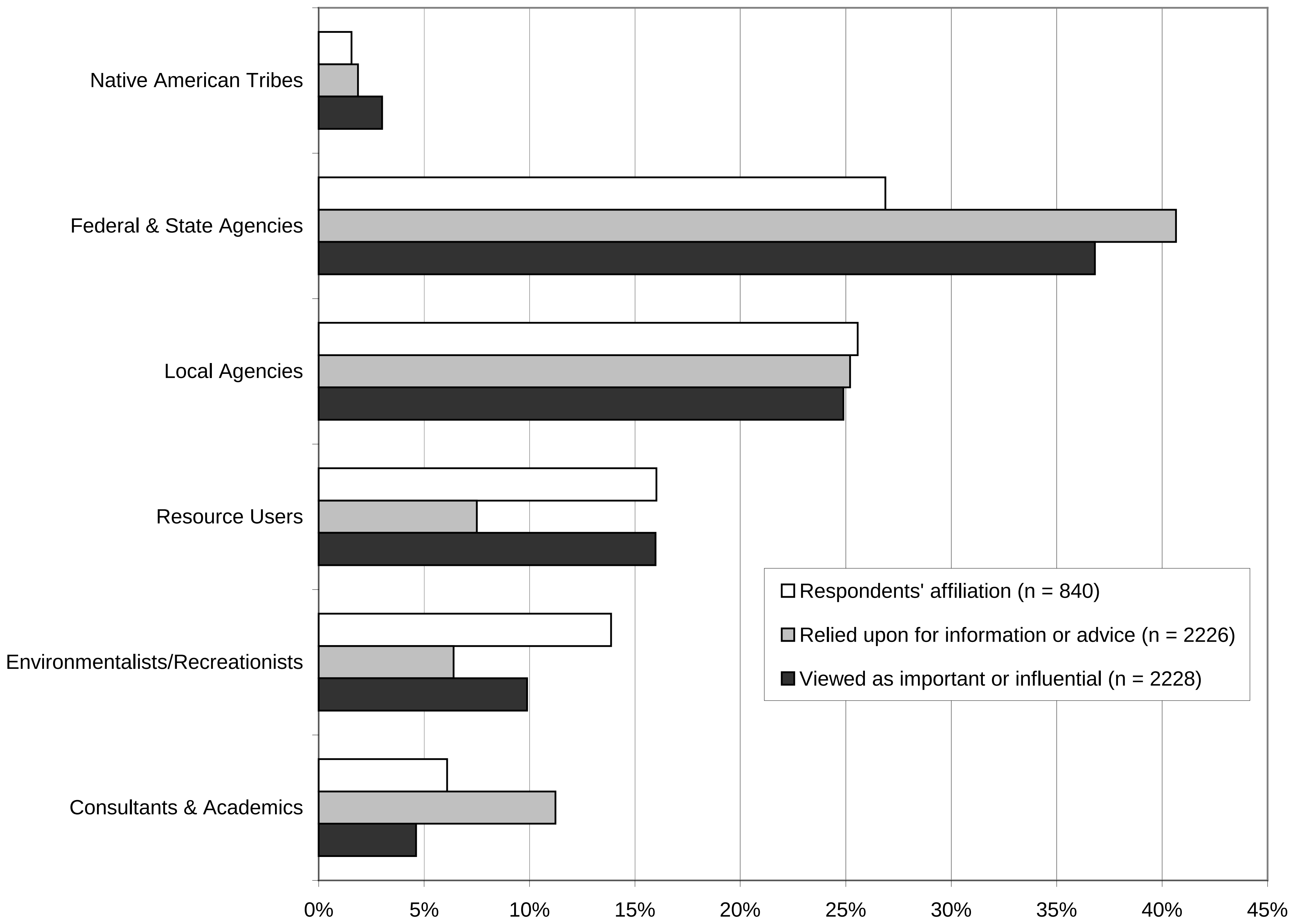


**FIGURE 2b.** Frequency at which each stakeholder category was named as being: (a) an important source of information or advice, or (b) important or influential




Each series sums to less than 100% because some respondents reported fewer than three stakeholders per question, and because 10% of the responses fall under an "other" category which is not displayed.

**Participation and decision rules**

Partnership meetings are typically open to the public. Only 3 of the 182 interviewees felt that a partnership had actively excluded a particular stakeholder. On the other hand, not all invited stakeholders actually participate. In 86% of partnerships, the interviewees were able to name at least one relevant stakeholder category that did not send a representative to partnership meetings.

Of the 50 partnerships studied, 92% used a consensus-based process for all or most decisions. Consensus was in the form a unanimous vote (12%), consensus among a subset of main participants (14%), or informed consent (76%)—i.e. participants can veto decisions they strongly oppose.[7] Seven partnerships (14%) required a majority or super-majority vote for some decisions, and another 3 partnerships (6%) used voting exclusively. In 7 partnerships (14%), at least one interviewee felt that the decision rules were somewhat unclear.

Consensus in this context means only that partnerships cannot force stakeholders to act against their will. A partnership may be able help identify previously unrealized areas of agreement, or mutually agreeable trades or compromises, but because participation is voluntary, the partnership can not prevent individual members from carrying out their otherwise legal or legally-mandated activities. In most cases it is the members, and not the partnership itself, that implements each of the agreed-upon projects or policies (Sinclair and Smith 1999, p 125). To enforce agreements, partnerships typically must rely upon peer pressure and the moral authority of the partnership (Rieke and Kenney 1997, p. 51).

Six partnerships (12%) took the form of a non-profit corporation including both a board of directors plus a broader "stakeholders group." A non-profit corporation has the ability to accept and appropriate grant money, whereas most partnerships rely upon a relatively neutral member organization, such as county agency, to apply for and administer grants on behalf of the partnership. In an incorporated partnership, the right to vote on budgetary matters, is limited to the directors, but the larger consensus-building (some would say, cajoling) function of the stakeholders group is much the same as in an informal partnership.

**Funding**

Three quarters of partnerships received outside funding from a government agency or private foundation. Among those with funding, the median total received from all sources since inception was $311,000. Securing money from sources external to the partnership avoids the problem of identifying which stakeholders will pay for a mutually beneficial project. Funding institutions often look favorably upon partnership-initiated grant applications because these projects, having been endorsed by all major stakeholders, will probably avoid the delays and litigation that often accompany local opposition. Funders may also presume that a project is more technically sound if it draws upon the expertise of multiple segments of society.

[7] Totals do not sum to 93% because partnerships may use different rules for different types of decisions.

# 3. EVALUATION CRITERIA

Following Connell and Kubisch (1998), we include measures of outcomes, actions, and agreements. Specifically, we measure (1) perceived impacts of the partnership on specific problems in the watershed, (2) perceived impacts of the partnership on human and social capital, (3) implementation of restoration projects, (4) education and outreach projects, (5) monitoring projects, and (6) the extent of agreement reached among the stakeholders.

The logic behind choosing these six criteria is summarized as follows. First, the ultimate success criterion for watershed partnerships is whether they actually improve water quality, water supply, or other conditions in the watershed. Unfortunately, there is very little existing baseline and post-project monitoring data on partnerships impacts, and certainly very few existing studies of impacts for the partnerships we studied. Therefore we are unable to provide a meta-analysis of such studies. The lack of existing data is partly due to the fact that most partnerships are relatively young (median age = 46 months) whereas ecological and socio-economic change evolves over many years. As a surrogate for actual impacts, we measure the stakeholders' perceptions of their partnership's impact. We also use perceptual survey data to measure whether each partnership has improved its participants' stores of human and social capital—a criterion that many watershed participants and scholars argue is necessary for long-term policy implementation and conflict resolution (Leach and Pelkey 2001).

To measure the remaining four criteria, we use factual data compiled from interviews and partnership documents, thus providing a relatively objective account of what each partnership implemented or agreed to do. The third and fourth criteria are restoration projects, and education/outreach projects. These are the policy instruments through which partnerships improve watershed conditions and human and social capital. Fifth, another type of policy output that scholars and stakeholders increasingly view as essential for adaptive management is for partnerships to monitor and assess their own impacts on watershed conditions (Huntington and Sommarstrom 1999; Yaffee et al. 1996). Finally, in order to implement projects, partnerships must agree to specific actions or a comprehensive management plan. The level of agreement reached is the sixth criterion.

The rationale behind each criterion and its operationalization is described below in detail sufficient to allow partnerships or their funding agencies to replicate our methods when performing periodic self-assessments or accountability reviews.

### Perceived Impacts on Watershed Conditions

The ultimate measure of success is a partnership's impacts on physical, biological, or social aspects of watershed-related problems. Measuring implementation alone is not sufficient because well-executed projects can fail to have the desired consequences due to poor design or unforeseeable events (Mazmanian and Sabatier 1989). In aquatic ecosystems for example, it is often difficult to identify the root causes of the problem, and restoration projects are often undone by acts of nature such as fires, floods, or drought (Kondolf and Micheli 1995).

The questionnaire asked survey respondents to evaluate their partnership's impacts on 12 problems ranging from impaired water quality to threats to Native American treaty rights (Figure 4). The scale for each evaluation ranged from -3 (the partnership made the problem much worse) to +3 (much better), centered at zero (no net impact). Respondents were also asked to assess, on a scale from 0 to 100, the seriousness of each problem in their watershed. To develop an overall score for each respondent, we weighted the 12 impacts by the corresponding seriousness of the problem. (The impact assessment was multiplied by the seriousness assessment, and the product was divided by the sum of all 12 seriousness scores, such that the final score ranges from -3 to +3.) The final index was calculated by averaging across all respondents for each partnership.

Weighting each of the 12 assessed impacts by the seriousness of the problem allows each respondent to effectively tailor the uniform list of issues to their own watershed. In this way, the assessments are fairly comparable across partnerships, even if different partnerships face different types of issues.

Figure 3 displays how each partnership scored on the index of perceived impacts on 12 watershed problems. Partnership scores were calculated by averaging across all survey respondents for each partnership.

All the partnership scores fall within a narrow band between -0.5 and +1.1, on a scale where -3 indicates that "the partnership has made the problems much worse," and +3 indicates "much better." Five of the 44 partnerships received negative scores, suggesting that they had made matters slightly worse overall.

Perceived impacts improve with the age of the partnership, on average.[8] Analysis of variance indicates that partnerships over six years old have significantly higher perceived impacts than partnerships in both the "under-2-years" and "2-to-4-year" age classes (F-ratio = 4.33, p-value < 0.01, Bonferroni multiple comparison test). The magnitude of this increase is small, however (about 0.4 on a 7-point scale).

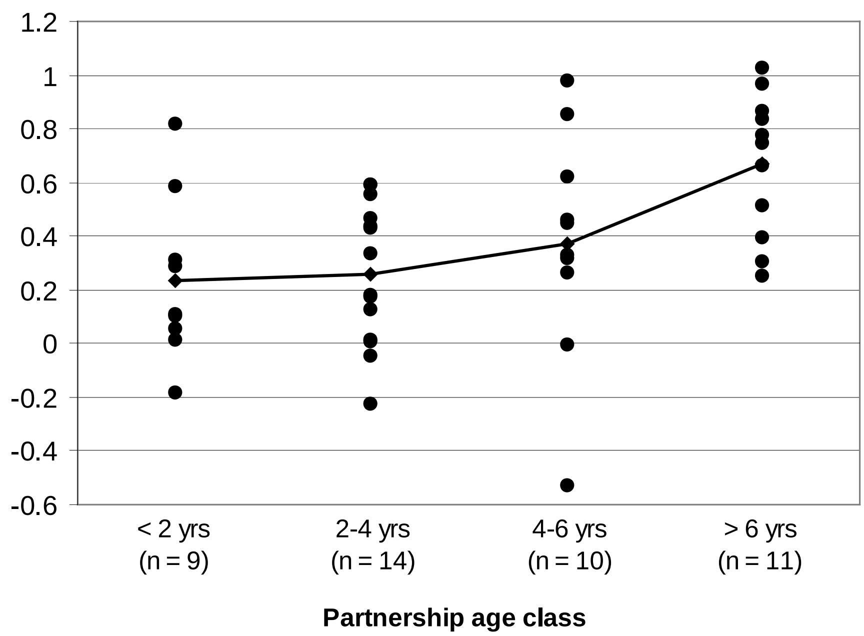



**Figure 3.** Partnership scores (n=44) on the index of perceived impacts on the watershed. Scale: -3 = very negative impact; +3 = very positive impact. Line connects mean partnership scores accross age classes.

[8] Age was measured in months from the inception of the partnership to the date of the interviews.

Figure 4 disaggregates the perceived impacts and perceived seriousness for 12 watershed problems. It appears that partnerships are most effective at addressing conflict among stakeholders, threats to species and habitat, and impaired water quality. These are also the three most serious problems, which suggests that partnerships probably address these problems most aggressively. Partnerships are also more effective at addressing local problems; some problems are beyond the control of most partnerships, as indicated by their near-zero medians and narrow ranges. These problems include water supply (which is dominated by state and federal agencies in California and Washington), population growth, and Native American treaty rights. Partnerships also entail significant risks. The ranges and center-bars that dip below the horizontal axis in Figure 4 indicate that a sizable minority of partnerships were judged to have aggravated certain problems. Specifically (but not discernible in Figure 4), in 29% of partnerships, the average respondent claimed that the partnership had harmed the economy. In 32% of partnerships, the average respondent claimed that the partnership had eroded private property rights. In 38% of partnerships, the average respondent claimed that the partnership had resulted in more excessive regulation or taxation. In 82% percent of partnerships, the mean evaluation was negative for at least one of the 12 problems.

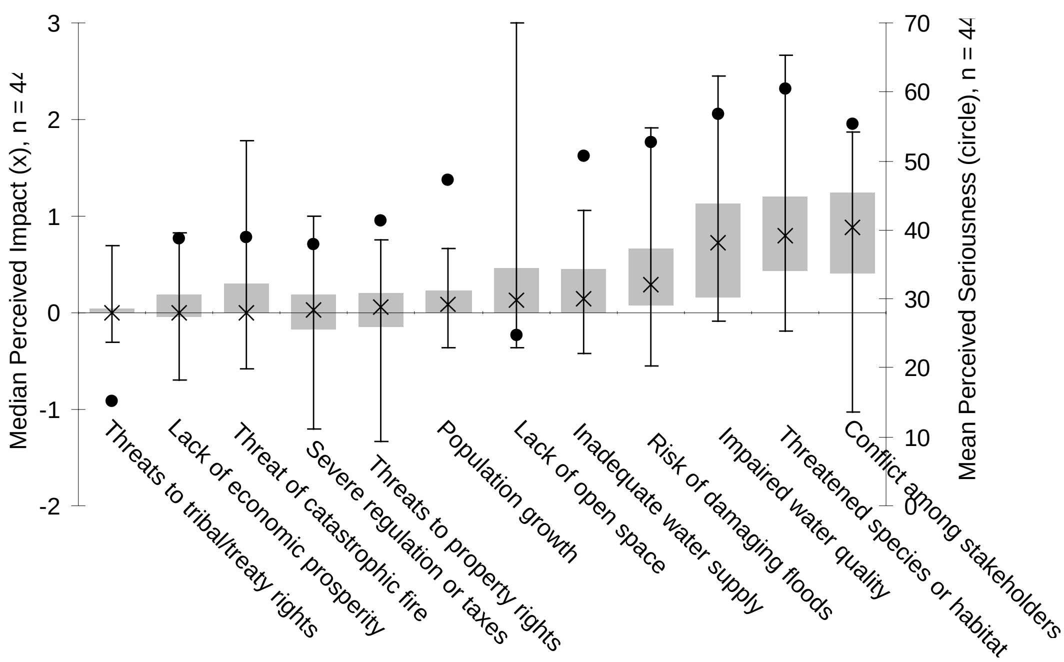



**Figure 4.** Perceived impacts of partnerships (n=44) on specific watershed problems. Left axis indicates the median (x), range (whisker), and central 50% of observations (shaded). Impact scale: -3 = very negative impact; 0 = no net impact; +3 = very positive impact. On the right axis, circles represent the mean perceived seriousness of each problem, on a scale where 0 = not at all a problem, and 100 = extremely serious problem.

**Perceived Impact on Human and Social Capital**

Another dimension of success is the extent to which a partnership has improved its stakeholders' capacity for achieving future, tangible, accomplishments. Partnerships have the potential to promote greater knowledge, new interpersonal relationships, and mutual understanding, which are believed to be important ingredients for fruitful collaboration (Leach and Pelkey 2001; Innes 1999; Ozawa and Podziba 1997; Innes et al. 1994). As conceptualized by Putnam (2000, 1993) and Coleman (1988), personal networks and relationships are key components of social capital, and pertinent knowledge is a key component of human capital. Both social and human capital can promote collective action among autonomous actors, such as the coordination that occurs in stakeholder partnerships. This measure is particularly appropriate for young partnerships that have not had time to attain other dimensions of success, or for partnerships whose progress has been impeded by especially high levels of initial conflict.

This criterion was measured by asking survey respondents to assess, on a 7-point Likert scale, whether the partnership has given them (a) new long-term friendships or professional relationships, (b) a better understanding of other stakeholders' perspectives, and (c) a better understanding of the physical or biological processes in the watershed. Each respondent's answers to the three questions were averaged, and the resulting scale was then averaged across all respondents for a given partnership to create a mean measure of the partnership's impact on social and human capital. The empirical justification for combining these three questions is that they scale reliably (Chronbach's $\alpha = 0.74$), and the factor loadings are quite high ($r = 0.82, 0.84, 0.79$), respectively.

In a longitudinal study, one could directly estimate each partnership's impact by measuring actual changes in knowledge and networks over time. In a cross-sectional study, however, one must rely on respondents' perceptions of the partnership's impact.

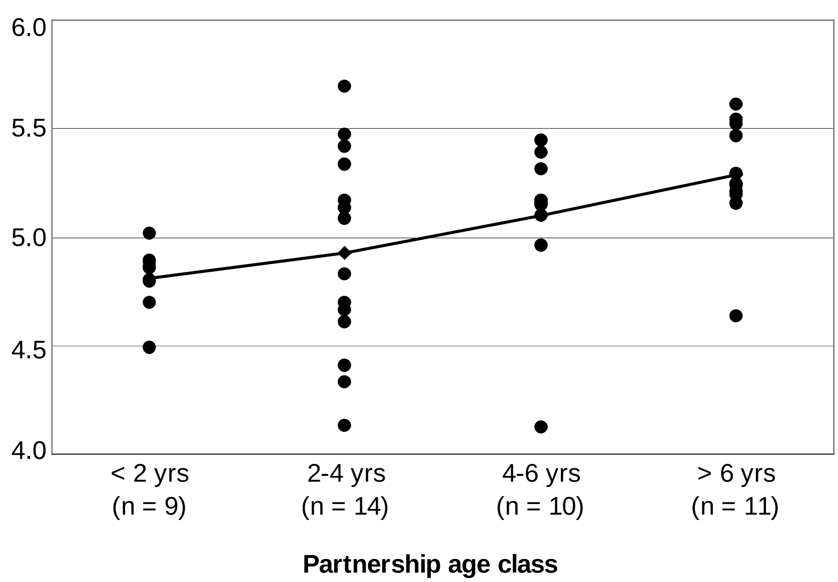



**Figure 5.** Partnership scores (n=44) on the index of perceived impacts on human and social capital. Scale: 1 = strongly disagree, 7 = strongly agree. Line connects mean partnership scores accross age classes.

Overall, partnerships appear to be quite good at building human and social capital. On the composite index, 100% of partnerships earned scores above the midpoint of 4, on a 7-point scale, where survey respondents can indicate whether they strongly agree or strongly disagree that their partnership has improved their personal stores of human and social capital (Figure 5). The rate of agreement, as measured by the index, rises gradually as partnerships age. Analysis of variance confirms that partnerships over six years old have significantly higher perceived impacts than partnerships under 2 years old. (F-ratio = 3.52, p-value < 0.05, Bonferroni multiple comparison test). The magnitude of this increase is small, however (about 0.4 on a 7-point scale).

Figure 6 disaggregates the three component questions of the index, and displays the proportion of partnerships that earned mean scores exceeding 5 on the 7-point scale. Partnerships are most effective at giving stakeholders a better understanding of each other's perspectives. Partnerships are least effective at fostering new long-term friendships or professional relationships—a somewhat surprising result given the literature's emphasis on networking as a secondary benefit of collaborative planning (Innes 1999, p. 652; Carr et al. 1998).

**Agreements, restoration projects, and monitoring**

Before projects can be implemented in the name of the partnership, participants must forge agreements about what should be done. The most basic agreements simply outline the partnership's goals or principles. In more advanced agreements, members of the partnership pledge to implement specific actions. Some partnerships are able to write and adopt a comprehensive watershed plan that integrates many specific projects or policy positions.

“Level of agreement” was measured using interviews and relevant documents to determine whether each partnership had achieved the following levels of agreement, which we treat as an ordinal five-point scale: (1) agreed to meet to identify issues, goals, or actions; (2) agreed on which

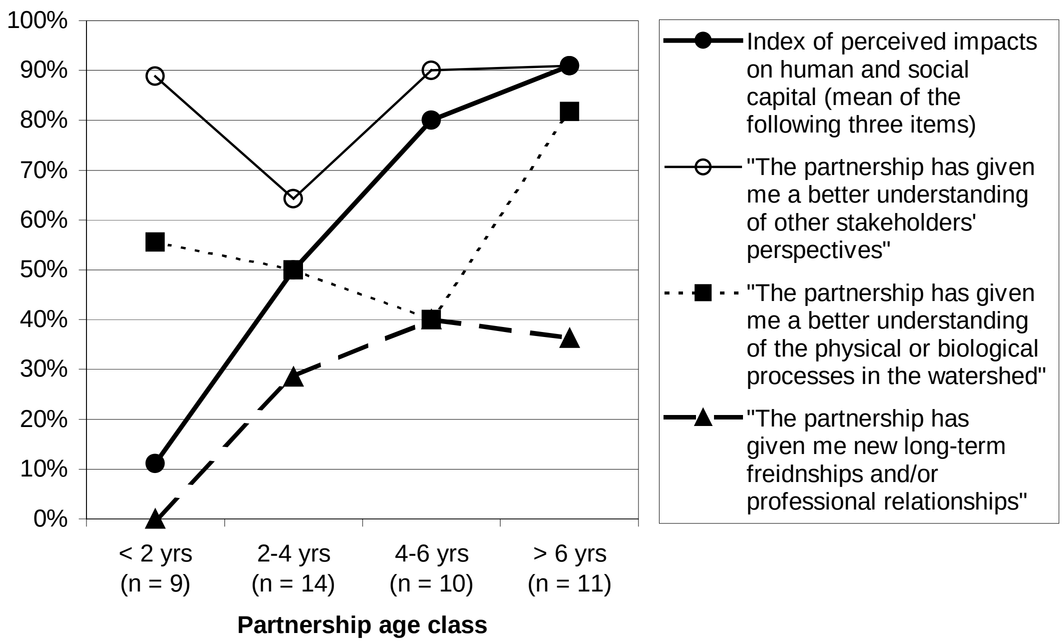



**Figure 6.** Proportion of partnerships (n=44) whose stakeholders, on average, agree* that their partnership has improved their own human or social capital in each of three ways. (*Specifically, the mean stakeholder response is 5 or greater on a scale from 1 = strongly disagree to 7 = strongly agree)

issue(s) to discuss/address; (3) agreed on general goals or principles; (4) agreed on one or more implementation actions (relatively limited and un-integrated); (5) agreed on a relatively comprehensive watershed management plan with specific projects or proposals.

Another central measure of success is the extent to which the members of a partnership have followed through on their commitments—regardless of whether these efforts have had sufficient time, fortune, or capability to achieve their intended purposes. In watershed-based partnerships, stakeholders frequently agree to implement on-the-ground restoration projects designed to improve local environmental or social conditions. We measured this dimension of success by compiling lists of attempted projects while accounting for variation in scope from one partnership to the next. We used interviews and partnership documents to evaluate progress on the four main types of restoration projects that watershed partnerships pursue:

1. Abatement or prevention of point or nonpoint sources of pollution.
2. Modifications to in-stream flows or water allocation.
3. Stream channel projects (restoration of vegetation, morphology, or biota).
4. Changes in land-use designations (through purchase, easements, zoning, etc.).

The resulting index is detailed in Figure 7. For each attempted activity, we credited one point; then added 0-4 points according to how much had been completed; then added 1-5 points depending on the geographic scope of the project. We then multiplied this sum by either 1 or 0.5 depending on whether the partnership deserved full or partial credit for the project's fruition. Finally, we summed these figures across all four types of projects to create an index ranging between 0-40.

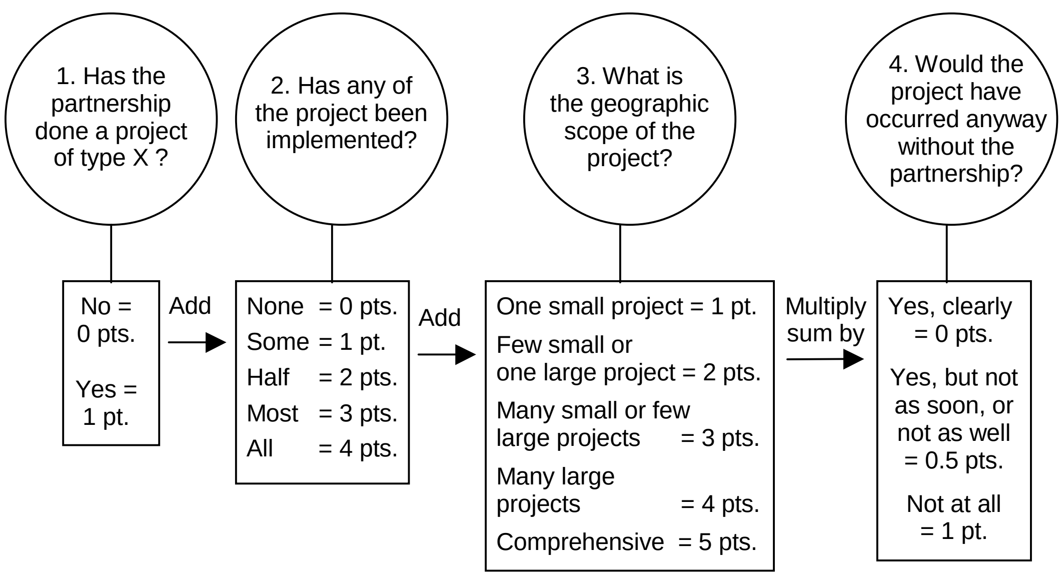



**Figure 7.** Index of restoration projects. The formula, based on data from interviews and documents, is repeated and summed for four types of restoration projects (see text).

When constructing indexes to generate ordinal data, the choice of which items to include in the index is generally much more important than the choice of weights (Miranda et al. 2000). For example, we found that multiplying the scope and completion scores, instead of adding, produced an index highly correlated with the additive index described above (Spearman's rho = 0.85).

A further dimension of success is a partnership's commitment to collecting sufficient information to assess its impact on targeted watershed conditions. Ideally, the partnership should collect both pre-project baseline data and post-project outcome data. Partnerships should also monitor whether restoration projects are being implemented as planned. Monitoring and assessment is essential for adaptive management—the process of adjusting course based on recent experience (Ewing et al. 2000).

We relied upon interviews and documents to determine whether each partnership had engaged in any pre-project baseline monitoring (3 points), post-project monitoring (2 points), or field-compliance monitoring—i.e. "Were projects properly carried out?" (1 point). The combined index ranges between 0 and 6.

Of the four types of restoration projects, changes in land-use and water allocation are about half as common as pollution abatement projects, and about one-third as common as stream channel projects (Figure 8). This pattern corresponds to the relative difficulty of each type of project. Stream channel projects are relatively uncontroversial; funding is usually the primary obstacle. Pollution abatement and prevention projects often require funding, but may also require industries or agencies to modify their behavior. Landuse changes, such as transferring farms or forests out of production, typically require large sums of money plus willing sellers, and often encounter resistance on ideological grounds. Changes in water allocation involve the same ideological issues, but the state constitutions of California and Washington create obstacles to changes in water rights.

More often than not, watershed partnerships that persist beyond their fourth year have achieved several benchmarks of success: agreements on proposed restoration projects, implementation of

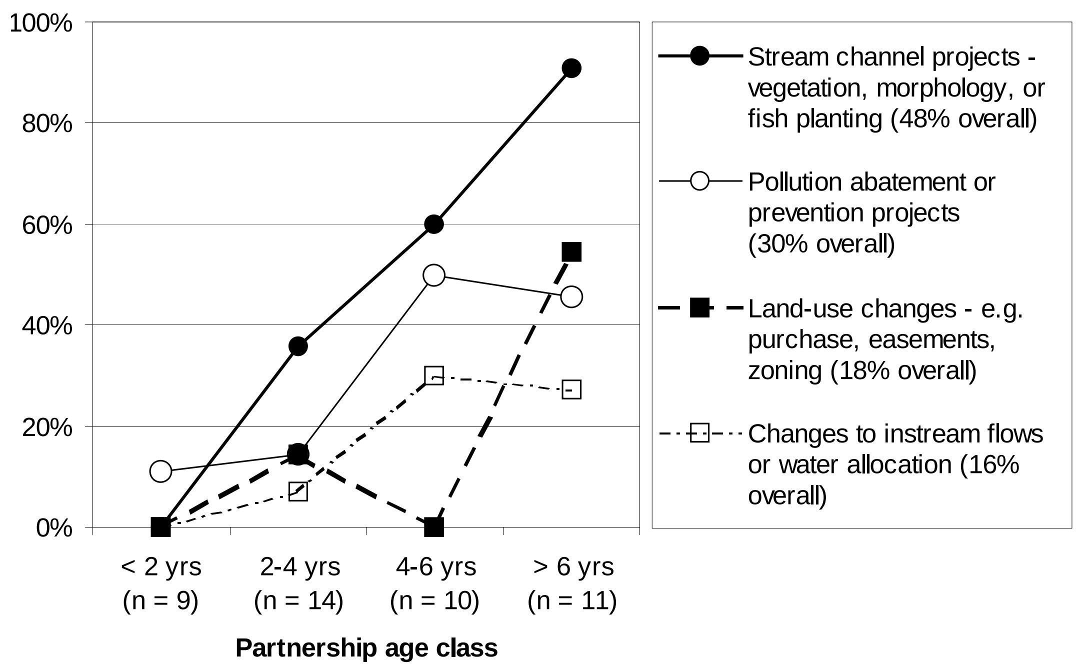



**Figure 8.** Proportion of partnerships with restoration projects (by type)

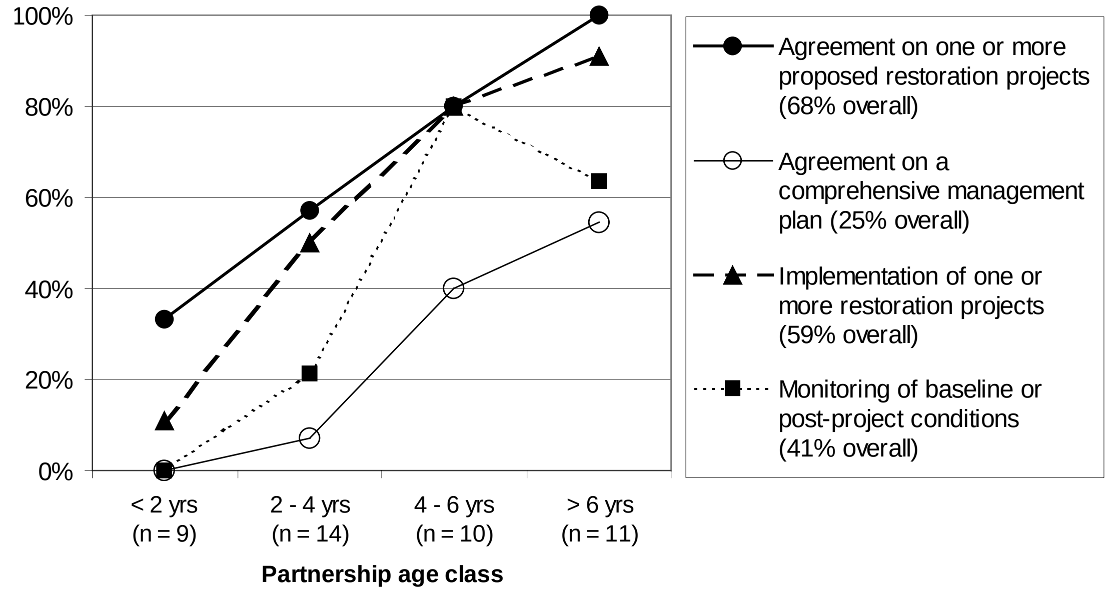



**Figure 9.** Proportion of partnerships with agreements, restoration projects, and monitoring.

restoration projects, and monitoring of project impacts. Figure 9 demonstrates clearly that older partnerships tend to be more successful than younger ones.
Of the nine partnerships in our sample that were under 2 years of age, only three had reached limited agreements, none had agreed to a comprehensive management plan, and only one had implemented any restoration projects. Of the 11 partnerships beyond their fifth year of operation, 100% had reached agreements, 54% had agreed to a comprehensive plan, and all but one had implemented at least one restoration project.

The observed increase in success rates over time may be partly due to attrition of failing partnerships. Unfortunately, we do not have data on the age at which each partnership achieved each benchmark; we only know the age of each partnership, and its total sum of accomplishments since its inception. Given the age distribution of extant and defunct partnerships, however, we can infer that attrition is only partly responsible for the trend. For attrition alone to account for the increased incidence of management plans among partnerships of the 4-to-6-year range compared to the 2-to-4-year range, for example, there would have to be nine defunct 2-to-4-year-old partnerships for every extant 4-to-6-year-old partnership. The actual ratio is on the order of 1:9 (not 9:1), according to our census of active and defunct partnerships in California.

### Education and Outreach Projects

For a number of reasons, watershed partnerships frequently decide that educating the general public or the stakeholders themselves is a necessary part of the solution. For example, a partnership might organize a workshop for local landowners to train them to become better stewards of the water and land. Outreach projects such as this can also help to build community support for partnerships, which are a rather novel and unfamiliar from of governance (Huntington and Sommarstrom 1999). By helping stakeholders reach consensus on the causes and consequences of various watershed problems, educational activities within the partnership (such as expert guest lectures) can facilitate future agreements on how to improve the watershed. Finally, education is also relatively easy to do, and thus provides a benchmark for evaluating young partnerships.

Education and outreach was assessed by recording whether each partnership had conducted any of 10 types of activities, listed in Figure 10. One point was credited for each activity to generate a 10-point scale. These data were drawn from the interviews and partnership documents. The trend of increasing success over time is equally evident for education/outreach projects. Education/outreach projects are also much more common (56%) than restoration projects (11%) for partnerships under two years old. Both types of projects eventually saturate at or near 100%, but this occurs earlier for education/outreach projects—after about 2-to-4 years. These results confirm the value of including this criterion in evaluations of younger partnerships.

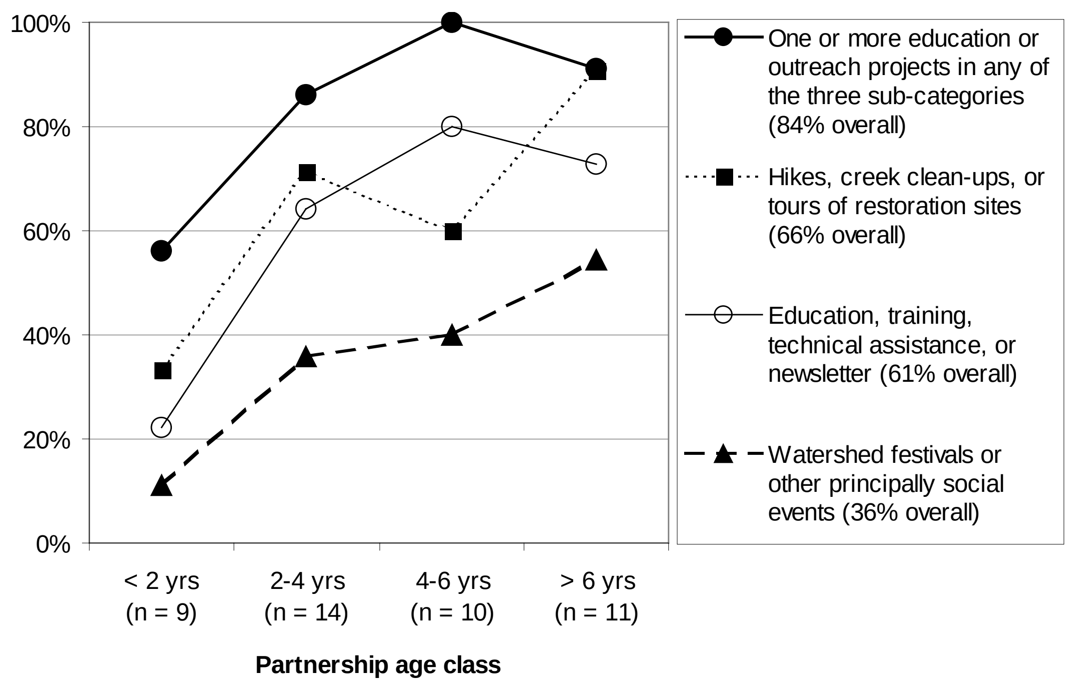



**Figure 10.** Proportion of partnerships with education and outreach projects (by type).

**Summary**

The data from California and Washington present a mixed picture of the ability of watershed partnerships to achieve their stated goals and objectives. Most partnerships older than 48 months have reached several milestones including agreements on proposed projects, and implementation of restoration, education, and monitoring projects. Stakeholders perceive that their partnerships have been most effective at addressing problems that can be managed at a local or regional scale. In about one-third of partnerships, the average stakeholder believes that the partnership has aggravated problems related to the economy, property rights, and regulation.

One sanguine finding is that partnerships apparently have the most positive impact on the most serious problems in the watershed, which suggests that partnerships devote more effort to serious problems. This finding contradicts the often-expressed fear, based on theory and anecdotes, that consensus-based processes avoid important issues and result in ineffectual agreements (Kenney 2000; Born and Genskow 1999, p.50; Griffin 1999). An important caveat is that survey data based on *perceived* impacts may be artificially inflated through the psychological phenomenon known as cognitive dissonance (Coglianese 2001; Festinger 1957). That is, stakeholders may subconsciously overestimate their partnership's effectiveness on serious problems to avoid the emotional discomfort produced by discrepancies between the partnership's priorities and its actual impacts.

One of the clearest findings is the positive relationship between each of the evaluation criteria and the age of the partnership. Cognitive dissonance may be partly responsible for this relationship for the measures of perceived impacts (because stakeholders will expect greater results for each month of effort), but dissonance cannot explain the importance of time for the four objective measures: restoration projects, monitoring, education, and agreements.

The importance of adequate time probably comes as little surprise to most scholars of public policymaking and implementation. Practitioners, however, have received this finding enthusiastically (when presented at various workshops). Most partnership participants report to supervisors who are suspicious of un-budgeted and un-billable commitments that consume a day or two per month, indefinitely. While a formal comparison of the costs and benefits of the partnership approach is beyond the scope of this report, our results do permit practitioners and their financial sponsors to compare their own partnership's progress to a large sample of similar efforts. The report documents what partnerships are likely to achieve, and at what pace.

# 4. EXPLAINING SUCCESS

The factors affecting success and failure are not well understood. Most of the available literature is of four types: theoretical essays, handbooks based on expert opinion, detailed case studies of one to several partnerships, and descriptive surveys of large numbers of partnerships (see Leach and Pelkey 2001). Each of these research designs has significant drawbacks. For example, the existing case studies generally suffer from subjective methods of data acquisition and analysis, and the small number of cases raises serious concerns about the generality of the results. The surveys of multiple partnerships usually solicit views from only one or two participants per partnership—typically the partnership coordinator. This approach is adequate for gathering factual information, but unreliable for examining the politics of high-conflict situations in which perceptions of success are likely to vary across participants. Compared to other participants, coordinators typically (a) view their partnership as being more successful, (b) express more trust in their fellow participants, and (c) have stronger pro-environmental values (Leach 2002).

The existing literature has spawned a bewildering number of so-called "lessons learned," which should probably be framed as "plausible hypotheses" considering the methodological limitations of the studies. Because each hypothesis is plausible, and each partnership is unique, it is conceivable that each hypotheses is valid under certain circumstances. On the other hand, if no partnership is entirely idiosyncratic, then it ought to be possible to discern the relative importance of the myriad potential keys to success. With a few notable exceptions (Beierle and Cayford 2001, Huntington and Sommarstrom 1999, Margerum 1999, Lubell 2000) there has been little systematic effort to test the lessons against data sets of appropriate size and complexity.

This chapter strives to supply such an analysis. Hypotheses are drawn from a recent review of 37 empirical studies (Table 9) published between 1990 and 1999 (Leach and Pelkey 2001). The review catalogued 210 lessons learned, organized the lessons into 28 thematic categories, and then tallied the number of studies that affirmed or contradicted each theme (Figure 11). In this chapter, we test the importance of each theme using data drawn from our 50 detailed case studies. The dependent variable is partnership success, measured by the six evaluation criteria described in Chapter 3.

**Explanatory Variables**

Funding. Funding ought to be important for carrying out education, restoration, and monitoring projects, and for hiring administrative staff or professional facilitators. We measure funding in terms of the log of the total amount of grant money received from sources outside the partnership since inception.

Effective coordinator or facilitator. A coordinator is someone who handles administrative, secretarial, and/or financial responsibilities for the partnership. A facilitator is the person chiefly responsible for running the meetings and fostering productive discussions and/or decisionmaking. Using interview data, we develop an index of coordination quality (Table 10) and an index of facilitation quality (Table 11). When using partnerships as the unit of analysis, we average the two indexes to create a single indicator, and thus gain one degree of freedom.

Scope of activities: limited and focused or broad and ambitious. There is no consensus in the literature on whether it is best to tackle multiple issues simultaneously, or whether it is more important to avoid spreading one's resources too thinly. We measure scope as a count variable ranging between 0 and 6, according to how many different types of activities the partnership has pursued. The six project types are: (1) pollution abatement projects, (2) stream channel projects, (3) modifications to in-stream flows or water allocation, (4) land use changes, (5) policy recommendations, and (6) education or outreach projects.

**Table 9.** Reviewed publications

| Publication | Cases | Location | Resources | Interviews | Survey responses [rate] |
|---|---|---|---|---|---|
| Born & Genskow, 1999 | 8 | USA | watersheds | | |
| Huntington & Sommarstrom, 1999 | 14 | Northwestern USA | watersheds | 24 | |
| Lubell, 1999 | 20 | coastal USA | estuaries | | 499 [30%] |
| Margerum, 1999 | 23 | USA and Australia | watersheds | 100+ | 285 [52%] |
| Margerum, 1999 | 1 | Queensland, Australia | estuary | | |
| McGinnis et al., 1999 | 3 | Calif. & Wash., USA | watersheds | | 221 [52%] |
| Woolley and McGinnis, 1999 | 3 | Calif. & Wash., USA | watersheds | | 206 [51%] |
| Mullen & Allison, 1999 | 6 | Alabama, USA | watersheds | | |
| Rickenbach, 1999 | 8 | Oregon, USA | watersheds | 50 | |
| Thomas, 1999 | 2 | California, USA | bioregions | | |
| Woodhill, et al., 1999 | 1 | NSW, Aust. | agricultural watershed | 120 | yes [NR] |
| Cantwell & Day, 1998 | 1 | BC, Canada | watershed | 20 | |
| Gordon & Jones, 1998 | 14 | USA | watersheds | 16 | |
| Manring, 1998 | 4 | USA | USFS National Forests | 31 | |
| Marshall, 1998 | 1 | BC, Canada | watershed | | |
| Penrose, et al., 1998 | 1 | BC, Canada | land use planning | 16 | |
| Salamon et al., 1998 | 1 | Illinois, USA | water pollution | 44 | |
| Toupal & Johnson, 1998 | 3 | UT, CO, WY, USA | watersheds | 41 | |
| Carr, et al., 1998 | NA | USA | USFS National Forests | | 128 [99%] |
| Schuett, et al., 1997 | NA | USA | USFS National Forests | | 113 [98%] |
| Mackenzie, 1997 | NA | Great Lakes | watersheds | 68 | |
| Moote, et al, 1997 | 1 | Arizona, USA | watershed | 9 | 42 [69%] |
| PCSD, 1997 | 15 | USA | Resource issues | | |
| Rieke & Kenney, 1997 | 12 | western USA | watersheds | 33 | |
| Wakeman III, 1997 | 3 | California, USA | estuaries | | |
| Holland, 1996 | 1 | Massachusetts, USA | watershed | | |
| McDonald & Shrubsole, 1996 | 14 | Queensland, Australia | watersheds | | 25 [89%] |
| Nugent, et al., 1996 | 1 | Washington, USA | Watershed and estuary | | |
| Yaffee, et al, 1996 | 105 | USA | ecosystems | | yes [NR] |
| Born & Sonzogni, 1995 | 1 | Wisconsin, USA | watershed | | |
| Curtis, et al., 1995 | 9 | Victoria, Australia | Sustainable agriculture | | 91 [71%] |
| Hooper, 1995 | NA | Australia | watersheds | | |
| Hooper, 1997 | NA | Australia | watersheds | | |
| Margerum & Born, 1995 | 2 | Wisconsin, USA | watersheds | | 74 [NR] |
| Innes, et al., 1994 | 12 | California, USA | Natural resources | 200 | |
| Wondolleck & Yaffee, 1994 | 7 | USA | ecosystems | 21 | |
| Farrow & Bower, 1993 | 1 | Florida, USA | marine | | |
| Landre & Knuth, 1993 | 4 | Great Lakes, USA | Bays and watersheds | 30 | 79 [90%] |
| Mitchell & Hollick, 1993 | NA | Western Australia | watersheds | | |
| Wallis & Robinson, 1991 | NA | Western Australia | watersheds | | |

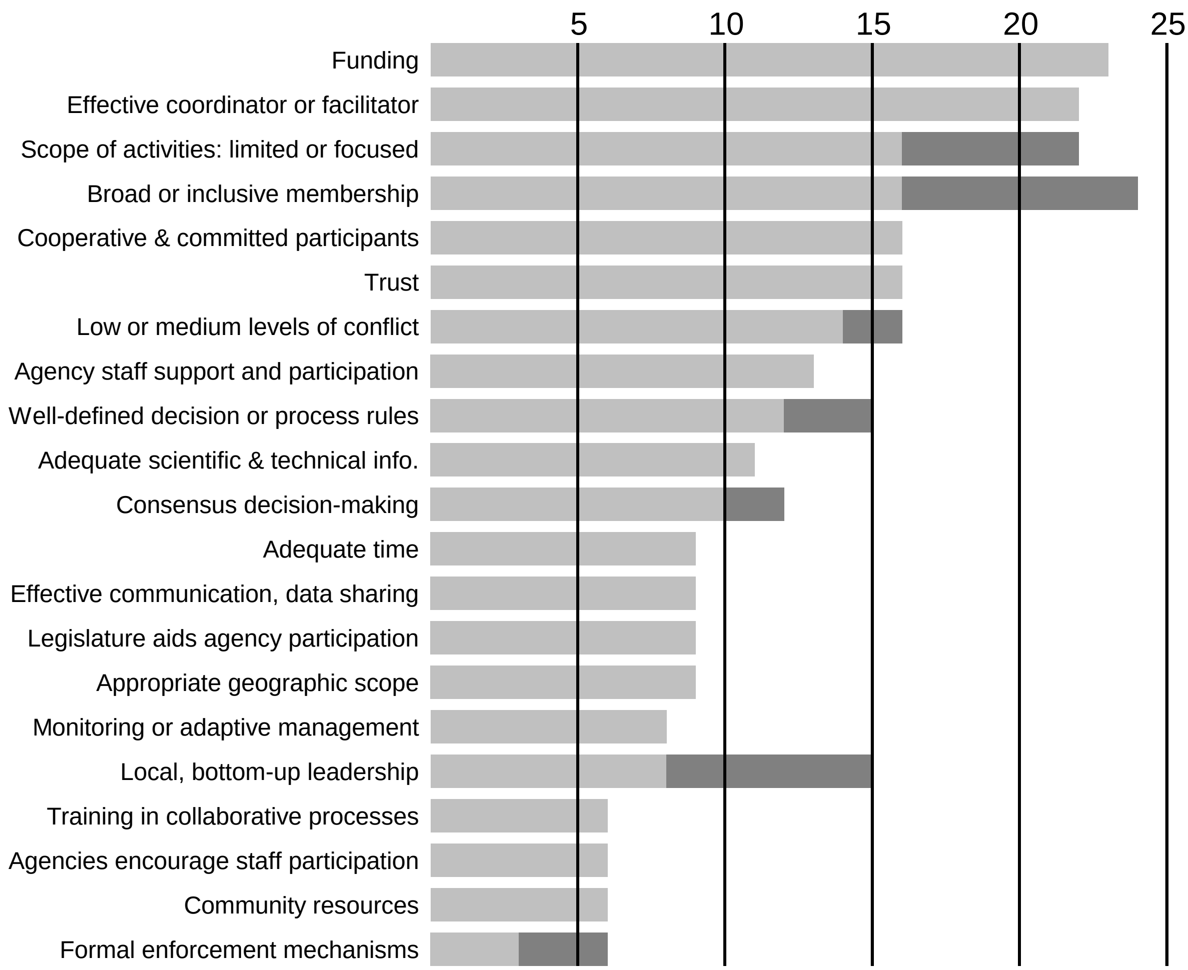



**Figure 11.** Number of studies (n=37) that affirm (light shading) or contradict (dark shading) the importance of each theme.

**Table 10.** Coordination quality index (Range: 0-6)

| Interview question | response range | Pts |
|---|---|---|
| Were there one or more coordinators? | no<br>yes | 0<br>1 |
| a. Was s/he seen as neutral or an advocate? | strong advocate<br>very neutral | 0<br>1 |
| b. Did s/he help significantly? | very harmful<br>very helpful | 0<br>4 |

**Table 11.** Facilitation quality index (Range: 0-6)

| Interview question | response range | Pts |
|---|---|---|
| Were there one or more recognized meeting facilitators who participated on a long-term basis? | no<br>yes | 0<br>1 |
| a. Was s/he a trained and/or career-track facilitator? | untrained<br>trained | 0<br>½ |
| b. Was s/he seen as neutral or an advocate? | strong advocate<br>very neutral | 0<br>½ |
| c. Did s/he help significantly? | very harmful<br>very helpful | 0<br>4 |

Broad or inclusive participation. In the eyes of many watershed stakeholders, the legitimacy of a partnership can be measured against the ideal of a participatory democracy. Legitimacy requires that anyone potentially affected by the actions of a partnership or its members should have an opportunity to participate or, at minimum, each affected group of stakeholders should have a participating representative. In Chapter 2, we reported interview data indicating that nearly all partnerships have inclusive participation rules, and yet most lack universal participation. We measure broad representation by asking survey respondents to agree or disagree that "The Partnership represents the interests of most people in the local community" (7-point scale).

Cooperative & committed participants. We measure commitment by asking survey respondents "How many hours per month do you spend on meetings and other work directly related to the Partnership?"

Trust. Trust is widely believed to be a prerequisite for consensus-based negotiations. We measure two facets of trust using survey data: interpersonal trust (Table 12), and trust in the partnership process (Table 13). Partnership-level indicators are created by averaging all individual scores on each scale.

Low or medium levels of conflict. If ideological differences among the stakeholders are too severe, agreements on tangible policies may be unattainable. On the other hand, if the stakeholders are all of like mind, they may perceive little need for new agreements, policies, or projects. We measure ideology using an eight-item scale from the survey (Table 14), and we measure conflict as the within-partnership standard deviation on the scale.

**Table 12.** Scale for interpersonal trust*

How many of the participants…

a. are honest, forthright, and true to their word? (ρ = 0.76)

b. have reasonable motives and concerns? (ρ = 0.76)

c. are willing to listen, and sincerely try to understand other points of view? (ρ = 0.83)

d. reciprocate acts of good will or generosity? (ρ = 0.83)

e. propose solutions that are compatible with the needs of other members of the partnership? (ρ = 0.82)

* 5-point Likert scale: 1=none, 2=few, 3=half, 4=most, 5=all
The scale is the mean of the five items. (Chronbach's α = 0.88)
ρ = nonparametric correlation between item and scale.

**Table 13.** Scale for trust in the partnership process*

a. The Partnership process treats all parties fairly and consistently.

b. The Partnership's discussions are civil, and marked by mutual recognition and respect.

* 7-point Likert scale: 1=storngly disagree, 7=strongly agree.
The scale is the mean of the two items.
Chronbach's α = 0.78. Nonparametric inter-item correlation ρ = 0.63

**Table 14.** Scale for environmental ideology*

a. People were intended to rule over the rest of nature. (ρ = 0.73)

b. Plants and animals exist primarily for use by people. (ρ = 0.74)

c. Environmental regulations should not be promulgated unless the proponents can prove that the monetary benefits will exceed the costs. (ρ = 0.78)

d. The best government is the one that governs the least. (ρ = 0.74)

e. A first consideration of any good political system is the protection of private property rights. (ρ = 0.78)

f. Government laws and regulations should primarily ensure the prosperity of business since the health of the nation is dependent upon the well-being of business. (ρ = 0.76)

g. Government planning almost inevitably results in the loss of essential liberties and freedoms. (ρ = 0.74)

h. Decisions about development are best left to the economic market. (ρ = 0.62)

* 7-point Likert-scale: 1 = strongly disagree, 7= strongly agree (re-coded to 7, 1)
Scale is the mean of the eight items. (Chronbach's α = 0.88)
ρ = nonparametric correlation between item and scale.

Agency staff support and participation. Agencies control many of the resources deemed necessary for effective watershed management including regulatory authority, authority to manage public lands, and technical and scientific expertise for outreach to private resource managers. Agency participation within each partnership is measured as the average number of hours per month that federal, state, and local officials report spending on "meetings and other work directly related to the Partnership."

Well-defined decision rules. A well-structured partnership is thought to be essential for converting discussions into action, and for maintaining a process that is sufficiently transparent to earn the confidence of both participants and the local community at large. We use the interviews to construct a dummy variable (1 or 0) for which a partnership receives a zero score if the rules for making decisions are unclear to any of the interviewees.

Adequate scientific & technical information. Many aspects of watershed management are highly technical, requiring complex data on the causes and seriousness of problems, scientific expertise to interpret those data, and engineering expertise to implement solutions. We measure this concept using survey data to develop a three-item scale (Table 15).

**Table 15.** Scale for scientific and technical information*

| | |
|---|---|
| a. | The existing body of technical information about our watershed is adequate. ($\rho = 0.72$) |
| b. | The data and information that do exist are easily accessible to all stakeholders. ($\rho = 0.79$) |
| c. | The partnership enjoys good access to people with sufficient training to evaluate scientific and technical information relevant to the partnership. ($\rho = 0.68$) |

* 7-point Likert-scale: 1 = strongly disagree, 7= strongly agree
Scale is the mean of the three items. (Chronbach's $\alpha = 0.59$)
$\rho$ = nonparametric correlation between item and scale.

Consensus decision-making. Over 90% of the partnerships in the sample used some form of consensus for some or all decisions (see Chapter 3). Voting rules—either simple-majority or super-majority—were employed by 20% of partnerships for some or all decisions. We include a dummy variable (1 or 0) to indicate those partnerships (80%) that use consensus exclusively.

Adequate time. Older partnerships should have had more opportunity for success than older partnerships. We measure age in months since partnership inception until the time of our interviews. For defunct partnership, we measure age as months between inception and disbandment.

Effective communication and data sharing. This concept is included in the "scientific and technical information" scale (Table 15).

Legislature aids agency participation. Several studies in our literature review called upon state and federal legislatures to give agencies a stronger mandate to participate in collaborative planning. Because our sample of partnerships covers only two U.S. states, our data include little variance on legislative support.[9]

[9] A dummy variable for California (versus Washington) proved statistically insignificant, when included in regression models similar to those shown in tables 17 and 18. Such a dummy variable captures all the legislative differences (and other unmeasured differences) between the two states.

Geographic scope. The literature makes conflicting assertions regarding which geographic scope is most appropriate for collaborative resource management. Several authors claim that hydrologic watersheds are best because they usually correspond to the "problem shed" (Gordon and Jones 1998; Born and Genskow 1999). Projects that focus on a single reach of a stream are susceptible to events upstream, and can create unforeseen downstream problems. Using similar logic, other studies imply that a broader, regional scope is necessary to accommodate large-scale ecological or political process (Innes, et al. 1994). Still others suggest that large watersheds may fail to promote norms of cooperative behavior and or a shared sense of place and interdependence (McGinnis et al. 1999; Penrose et al. 1998). Large watersheds can also present an unwieldy number of issues and interests or excessive travel distances for participating stakeholders (Thomas 1999). We measure geographic scope as the log of the number of square miles in the partnership's planning area.

Monitoring or adaptive management. Monitoring is a prerequisite for adaptive management—the process of learning from experience as the partnership progresses, and changing course as appropriate. In our study, we treat monitoring as a dependent variable (described in Chapter 3).

Local, bottom-up leadership. Some stakeholders feel that the legitimacy of a partnership, and ultimately its success, depends on having a locally-led, grassroots effort. The opposite extreme would be a partnership led by officials and executives from outside the watershed conspiring to impose policies on an unwilling local community. To measure local leadership, we first assume that leaders are those respondents who work on partnership activities at least 10 hours per month, which places them in the top third of all respondents in terms of hours. We then measure the proportion of leaders in each partnership who reside in the watershed.

Training in collaborative processes. We include a dummy variable indicating whether a professional facilitator was brought in to either help initiate the partnership, or to train the participants in effective collaboration techniques.

Agencies encourage staff participation. Agency administrators are often skeptical of watershed partnerships because they can take many months or years to generate tangible products. Agency staff who wish to dedicate time to a partnership are sometimes required to do outside of their regular payroll hours. We measure agency support in the survey by asking federal, state, and local officials, "When you attend meetings or conduct other Partnership business, is this on 'company time' or your own time?" The 7-point response scale runs from "all company time" to "all own time." For each partnership, we average the responses among all agency officials.

Community resources. The literature suggests that wealth, education, and social capital are resources conducive to successful collaborative planning and implementation. We lack measures of wealth, but we do include education, and gender, measured using the survey, and averaged to create partnership-level indicators. We also ask respondents to report whether they live in the watershed, which might be related to their knowledge of, and commitment to the watershed. To measure a respondent's social capital, we present them with a list of eleven types of organizations (including civic, social, recreational, professional, etc.), and ask them to report the number of such groups they participate in. This tally of groups joined reflects an individual's "networks of reciprocity," an aspect of social capital described by Putnam (1993).

Formal enforcement mechanisms. Stakeholders may be tempted to renege on commitments unless mechanisms are in place to curtail such behavior. During the interviews, we determined whether each partnership had provisions for enforcing agreements through means other than simple peer pressure. We include a dummy variable (1 or 0) to indicate whether enforcement provisions are in place.

**Table 16.** Descriptive statistics for explanatory variables

| | N | Min | Max | Mean | Std. Dev. |
|---|---|---|---|---|---|
| Grant funding (log $+1) | *902 | 0 | 7 | 4.03 | 2.48 |
| Coordination quality (index) | *902 | 0 | 6 | 2.73 | 2.42 |
| Facilitation quality (index) | *902 | 0 | 6 | 3.07 | 2.17 |
| Facilitation & coordination quality (index) | 50 | 2.25 | 6 | 4.58 | 0.79 |
| Scope of activities (index) | *902 | 0 | 6 | 2.54 | 1.48 |
| ^ Broad representation (scale) | 876 | 1 | 7 | 4.4 | 1.61 |
| % Broad representation (scale) | 50 | 2.5 | 6.7 | 4.4 | 0.83 |
| ^ Committed participants (hours/month) | 902 | 0 | 220 | 11.0 | 20.8 |
| @ Committed participants (hours/month) | 50 | 4.33 | 46 | 19.25 | 9.95 |
| ^ Interpersonal trust (scale) | 883 | 1 | 5 | 3.62 | 0.67 |
| % Interpersonal trust (scale) | 50 | 2.88 | 4.5 | 3.66 | 0.36 |
| ^ Trust in the process (scale) | 873 | 1 | 7 | 4.95 | 1.51 |
| ^ Enviromental ideology (scale) | 902 | 1 | 7 | 4.85 | 1.35 |
| % Environmental ideology (scale) | 50 | 3.78 | 6.16 | 4.92 | 0.54 |
| Ideological conflict (standard deviation) | *902 | 0.16 | 1.79 | 1.26 | 0.24 |
| Agency staff participation (hours/month) | *902 | 1.5 | 57 | 13.4 | 10.9 |
| Well-defined decision rules (1 or 0) | *902 | 0 | 1 | 0.87 | 0.33 |
| ^ Adequate scientific information (scale) | 885 | 1 | 7 | 4.35 | 1.31 |
| % Adequate scientific information (scale) | 50 | 3.31 | 5.93 | 4.44 | 0.60 |
| Consensus-based decision rules: (1 or 0) | *902 | 0 | 1 | 0.75 | 0.43 |
| Age of partnership (months) | *902 | 4 | 332 | 63.3 | 53.6 |
| Geographic scope (log sq. miles) | *902 | 0 | 4.26 | 2.69 | 0.76 |
| Local leadership (scale) | *902 | 0 | 1 | 0.45 | 0.32 |
| Training in collaboration skills (1 or 0) | *902 | 0 | 1 | 0.21 | 0.41 |
| Agencies support staff participation (scale) | *902 | 0.8 | 6 | 4.35 | 1.10 |
| ^ Bachelor's degree (1 or 0) | *902 | 0 | 1 | 0.85 | 0.36 |
| ^ Female (1 or 0) | 889 | 0 | 1 | 0.28 | 0.45 |
| ^ Live in the watershed (1 or 0) | 898 | 1 | 2 | 1.46 | 0.50 |
| ^ Social capital networks (count variable) | 902 | 0 | 26 | 6.10 | 4.10 |
| Formal enforcement mechanisms (1 or 0) | 902 | 0 | 1 | 0.23 | 0.42 |
| ^ Participant vs. observer (1 or 0) | 900 | 0 | 1 | 0.82 | 0.38 |

^ Variables that vary by respondent.

* Variables that vary by partnership (such that effectively n=50), and that we attribute to all survey respondents according to the partnership to which they belong.

% Individual scores on these scales were averaged to create partnership-level indicators.

@ Averaged from among the top ten most active within each partnership.

## Results and Discussion

The goal of this chapter is to test the "lessons learned" from the literature by using the variables described above to explain why some partnerships are more successful than others. Table 16 presents descriptive statistics for each of the explanatory variables.

The analysis is in two parts. The first part focuses on the two subjective measures of success, in which each survey respondent is asked a number of questions to develop an index of "perceived impacts on watershed conditions" as well as a scale for "perceived impacts on human and social capital" (see Chapter 3 for details). Regression models are used to identify the characteristics of both partnerships and stakeholders that influence how individual stakeholders perceive success, and to test the relative importance of each characteristic. Whereas Part One uses the survey data directly, Part Two uses the 50 partnerships as the unit of analysis, and includes all six evaluation criteria, including both subjective and objective measures of success.

<u>Part One: Modeling stakeholders' perceptions of success</u>. Table 17 presents OLS regression models for the two subjective evaluation criteria, using individual survey responses as the unit of analysis. In other words, the dependent variables are the respondent's personal assessments of how their own partnership has affected (1) conditions in the watershed, and (2) their personal human and social capital. The models include variables measured at the individual level (e.g. gender), as well as variables characterizing the respondent's partnership as a whole (e.g. age of the partnership). Explanatory variables are listed in Table 19, with the variables cited most frequently in the literature listed first.

After *grant funding,* which is not significant in either model, the next 6 themes (measured using 9 variables) are statistically significant in one or both models. These themes are *coordination /facilitation quality, scope of activities, broad representation, committed participants, trust, environmental ideology and ideological conflict.* The observed relationships are consistent with the hypothesized effect of each variable, except in the case of facilitation, which is negatively correlated with perceived impacts on watershed conditions. On a related theme farther down the list, we found no support for the importance of using facilitators to help initiate the partnership by *training participants in collaboration skills.*

Regarding the proper *scope of activities,* a variable for which the literature includes conflicting hypotheses, our results show that partnerships that attempt to address a larger array of problems and projects earn higher marks for perceived impacts on watershed conditions. How to determine which *geographic scope* would be most conducive to success is another question with conflicting hypotheses in the literature. In our study, larger watersheds are associated with more positive perceptions of impacts on watershed conditions.

The models show clearly that respondents tend to perceive higher levels of partnership success if they also perceive *broader representation,* have more *trust* in their fellow members, have more *trust* in the partnership process, and if they have a stronger *environmental ideology.* The importance of ideology reflects the fact that stakeholders who place a higher value on economic freedoms relative to environmental quality are more likely to perceive that the partnership has harmed the economy, property rights, or regulatory and tax policy.

In partnerships with high levels of *ideological conflict,* individual respondents perceive less progress on improving watershed conditions. This result is consistent with the notion that ideological diversity impedes progress on agreements and projects. By contrast, *ideological conflict* is associated with perceptions of greater progress on building human and social capital. Perhaps ideologically diverse partnerships offer more opportunities for cross-cultural learning and networking.

**Table 17.** Models of subjective evaluation criteria, with respondents as the unit of analysis

| | Perceived impact on the watershed<br>n = 738<br>adj. $R^2$ = 0.47 | Perceived impact on human & social capital<br>n = 764<br>adj. $R^2$ = 0.34 |
|---|---|---|
| (Constant) | NA *** | NA |
| Grant funding (log $+1) | -0.04 | -0.06 |
| Coordination quality (index) | 0.06 # | -0.01 |
| Facilitation quality (index) | -0.09 * | 0.08 # |
| Scope of activities (index) | 0.13 ** | 0.06 |
| ^ Broad representation (scale) | 0.18 *** | 0.12 *** |
| ^ Committed participants (hours/month) | 0.04 | 0.16 *** |
| ^ Interpersonal trust (scale) | 0.26 *** | 0.24 *** |
| ^ Trust in the process (scale) | 0.15 *** | 0.21 *** |
| ^ Environmental ideology (scale) | 0.23 *** | 0.10 ** |
| Ideological conflict (standard deviation) | -0.09 * | 0.08 * |
| Agency staff participation (hours/month) | -0.01 | -0.04 |
| Well-defined decision rules (1 or 0) | 0.08 * | -0.08 * |
| ^ Adequate scientific information (scale) | 0.09 ** | 0.08 * |
| Consensus-based decision rules (1 or 0) | 0.07 # | -0.05 |
| Age of partnership (months) | -0.04 | 0.07 |
| Geographic scope (log sq. miles) | 0.13 *** | -0.02 |
| Local leadership (scale) | -0.06 * | -0.09 ** |
| Training in collaboration skills (1 or 0) | -0.05 | -0.02 |
| Agencies support staff participation (scale) | 0.01 | 0.04 |
| ^ Bachelor's degree (1 or 0) | 0.04 | 0.02 |
| ^ Female (1 or 0) | -0.03 | 0.07 * |
| ^ Live in the watershed (1 or 0) | 0.08 ** | 0.00 |
| ^ Social capital networks (count variable) | -0.05 # | -0.04 |
| Formal enforcement mechanisms (1 or 0) | 0.04 | 0.03 |
| ^ Participant vs. informed observer (1 or 0) | -0.01 | 0.08 ** |

^ Variables that vary by respondent in this analysis. Others vary by partnership.

Standardized coefficients. #p<0.10, *p<0.05, **p<0.01, ***p<0.001

The effect of well-defined decision rules is decidedly mixed. When decision rules are clear, stakeholders report greater progress on improving watershed conditions but less progress on improving human and social capital. This combination of results suggests that a dichotomy exists in our sample of partnerships between those that focus on decisionmaking and/or implementation versus those that focus on information sharing and networking.

We also find mixed support for the value of consensus-based decision making. In partnerships that use consensus decision rules exclusively (never proceeding through simple or super-majority votes), respondents rated their partnership as being somewhat more successful in terms of impact on watershed conditions. However, this result is only marginally significant, statistically.
We found no support for the importance of the average *intensity* of agency staff participation, measured as the mean number of hours dedicated per month by federal, state, and local officials. However, we also found fairly strong evidence to refute the importance of local leadership, measured as the proportion of highly active participants who reside within the watershed. Stakeholders perceive greater success in partnerships that have higher percentages of highly active outsiders. As the results from Chapter 2 show, participants from outside the watershed are most likely to be state or federal officials. Together, these results support the importance of having several highly active outsiders, who are likely to be state or federal officials with access to regulatory, technical, or financial resources. On a related note, respondents who perceive that the available scientific and technical information is adequate are more likely to perceive success. The extent to which agencies allow their staff to participate on "company time" is apparently unrelated to either success variable, at least within the observed range.

Several demographic variables are important for explaining an individual's perception of success. Women are more likely to report improvements in human and social capital than are men. Stakeholders who live in the watershed are more likely to perceive success on improving watershed conditions. This result could be attributable to cognitive dissonance, as watershed residents should have a stronger interest in the success of the partnership. Stakeholders who are members of multiple organizations (social, cultural, recreational, etc.) tend to perceive less success on improving watershed conditions, however the effect is small and only marginally significant ($p<0.10$). Education level is not significant.

Finally, participants and knowledgeable non-participant observers have comparable perceptions of a partnership's impact on watershed conditions, on average. However in a separate analysis (Leach 2002), we found that participants tend to have more extreme perceptions (either more positive or more negative) even though the average perception of participants and non-participants as groups are similar. As for the partnership's impact on respondents' human and social capital, participants naturally report a significantly more positive impact.

<u>Part Two: Modeling partnership success</u>. Table 18 presents OLS regression models for the six evaluation criteria. With only 50 observations, there are not enough degrees of freedom to include all 25 explanatory variables. Therefore, we selected a subset of 12 variables emphasizing those that are most prominent in the literature and those that were significant or nearly significant in the Part One analysis.

Except for *well-defined decision rules* and *technical information*, each of the explanatory variables is statistically significant in at least one model. *Partnership age* is significant for five of six models. *Funding* is significant for four of six, including all four objective evaluation criteria. *Interpersonal trust* is also significant for 4 models. Trust is by far the dominant factor for both of the subjective measures of perceived impacts.

*Local leadership* is negatively associated with agreements and monitoring projects. This result is generally consistent with the Part One analysis, where local

**Table 18.** Models for six evaluation criteria (n = 50 partnerships)

| | Perceived impact on the watershed | Perceived impact on human and social capital | Level of agreement | Restoration projects | Monitoring projects | Education and outreach projects |
|---|---|---|---|---|---|---|
| adj. $R^2$ | 0.76 | 0.45 | 0.49 | 0.38 | 0.54 | 0.17 |
| (Constant) | NA *** | NA # | NA | NA | NA * | NA |
| Grant funding | 0.07 | 0.11 | 0.32 ** | 0.32 * | 0.37 ** | 0.40 ** |
| Facilitation & coordination quality | 0.01 | 0.28 * | -0.28 * | 0.07 | -0.06 | 0.09 |
| % Broad representation | 0.06 | 0.08 | 0.33 * | -0.08 | 0.13 | 0.09 |
| @ Committed participants | -0.03 | 0.16 | 0.19 | 0.01 | 0.23 # | 0.21 |
| % Interpersonal trust | 0.70 *** | 0.42 ** | 0.18 | 0.15 | 0.24 # | 0.36 # |
| % Environmental ideology | 0.39 *** | -0.01 | 0.16 | 0.07 | 0.08 | 0.01 |
| Ideological conflict | -0.02 | 0.12 | 0.26 | 0.31 # | 0.21 | 0.31 |
| Well-defined decision rules | -0.05 | -0.17 | 0.03 | -0.08 | 0.00 | -0.07 |
| % Adequate scientific information | 0.04 | 0.15 | 0.09 | 0.17 | 0.17 | -0.27 |
| Age of partnership | 0.22 * | 0.23 | 0.39 ** | 0.56 *** | 0.39 ** | 0.30 # |
| Geographic scope | 0.20 * | -0.01 | 0.09 | -0.03 | -0.01 | -0.05 |
| Local leadership | 0.01 | 0.01 | -0.33 ** | -0.19 | -0.31 ** | 0.17 |

% Individual scores on these scales were averaged to create partnership-level indicators.

@ Averaged from among the top ten most active within each partnership.

Standardized coefficients. #p<0.10, *p<0.05, **p<0.01, ***p<0.001

leadership was significantly and negatively associated with success. However, in the Part Two analysis, the relationship disappears for both subjective measures of success.

One surprising result is the positive and nearly significant relationship between *ideological conflict* and the four objective success measures. This result contradicts the negative relationship between conflict and "perceived impact on the watershed" in the Part One analysis. It also contradicts the conventional wisdom that ideological conflict impedes consensus. One plausible explanation is that medium to high levels of conflict are necessary to motivate the stakeholders to persevere through the arduous process of crafting and implementing projects and watershed management plans.

For the two subjective evaluation criteria, the Part One and Two results are generally consistent, with a few interesting contradictions. In both Part One and Two, trust, ideology, and geographic scope are among the most important explanatory themes (in order of decreasing importance based on standardized regression coefficients and t-values) for modeling perceived impact on the watershed. Each of the other variables that were significant in Part One, and that were included in both analyses, become statistically insignificant in the Part Two analysis. However, the direction of the effects (based on the signs of the coefficients) is consistent in both analyses, suggesting that the lack of significance in Part Two stems from insufficient degrees of freedom. The one major difference between the two models of "perceived impact on the watershed" is that the age of the partnership becomes significant and positive in the Part Two analysis.

When modeling "perceived impacts on human and social capital," trust is the most important variable in both Part One and Two. Other variables that are significant in the Part One analysis are insignificant in Part Two—again possibly due to insufficient degrees of freedom. The one major difference between the two models is that the combined index of coordination and facilitation quality has a relatively large and significant effect in Part Two. In Part One, coordination quality is unrelated to success, and facilitation quality is only moderately related. The two indexes are negatively correlated (ρ = 0.43) because all partnerships in our sample have a facilitator (n=34) and/or coordinator (n=31), and are more than twice as likely to have either one (n=35) rather than both (n=15). On the whole, the combination of results suggests that the roles of facilitators and coordinators are important for promoting human/social capital, and that quality facilitation is somewhat more important than quality coordination.

In the case of "perceived impacts on watershed conditions," the Part One analysis indicates that coordination quality is positively associated with success while facilitation quality is negatively associate with success. This result is supported by an auxiliary model with partnerships as the unit of analysis, and separate facilitation and coordination quality indexes included as explanatory variables (Table 19). The direction of the effects is consistent with the Part One analysis, however neither effects is highly significant, statistically.

The facilitation/coordination quality index is also negatively associated with another measure of success, "level of agreement." The negative association between success and facilitation quality is perplexing, and uniformly contrary to the literature. Perhaps these results reflect the existence of many partnerships that continue to stumble despite their best efforts at facilitation, rather than because of facilitation. Partnerships might not invest in high-quality facilitation unless they are having serious difficulty reaching consensus and achieving partnership goals.

**Table 19.** Auxiliary reduced-form model of "perceived impact on the watershed"

| | n = 50<br>adj. $R^2$ = 0.81 |
|---|---|
| (Constant) | NA *** |
| Grant funding | 0.15 * |
| Coordination quality | 0.09 |
| Facilitation quality | -0.15 # |
| % Interpersonal trust | 0.75 *** |
| Ideological conflict | 0.32 *** |
| Age of partnership | 0.20 ** |
| Geographic scope | 0.22 ** |

% Individual scores were averaged to a create partnership-level indicator

Standardized coefficients.
#p<0.10, *p<0.05, **p<0.01, ***p<0.001

## Main conclusions

Trust, funding, and time since inception are the most important predictors of success overall. Partnerships that represent most interests in the local community are more likely to reach agreements within the partnership. Ideological conflict within a partnership is positively related to social capital building, and may have a paradoxically positive impact on agreements, restoration projects, and monitoring. Regarding the highly disputed effect of local leadership, we find relatively strong evidence for the importance of active participants from outside the watershed. The influence of coordinators and facilitators is complex, and deserves further study.

# 5. SUMMARY OF FINDINGS

Findings from the UC Davis Watershed Partnerships Project are summarized below as they relate to the six original objectives of the grant proposal funded by the US EPA, STAR Program (see Chapter 1 for detailed objectives). After reviewing the findings, we outline priorities for future research.

**Objective 1**

"To improve our understanding of the factors affecting the ability of stakeholder negotiation processes to reach formal agreements and to implement those agreements"

Findings: Trust, funding, and time since inception are the most important predictors of success overall. Several other factors are also important—often in ways that contradict the conventional "lessons learned" from the literature on watershed partnerships.

Ideological conflict within a partnership is positively related to social capital building, and may have a positive impact on agreements, restoration projects, and monitoring.

Local leadership is associated with fewer agreements, less monitoring, and stakeholders who perceive less progress on improving watershed conditions and human and social capital. In other words, we find relatively strong evidence for the importance of active participants from outside the watershed (who typically are state or federal officials).

As predicted by much of the literature, broad representation of interests in the local community is associated with partnerships that achieve higher levels of agreements within the partnership itself.

The influence of coordinators and facilitators is complex, and deserves further study. Facilitation quality is associated with increased levels of human and social capital but decreased levels of agreement (consensus) among stakeholders.

**Objective 2**

"To ascertain whether consensus-based negotiating processes have been more successful than other approaches in developing and implementing concrete projects"

Findings: Thus far, we have documented what partnerships have achieved in California and Washington, and have documented how long it typically takes to reach each benchmark of success. Stakeholders can use these results to score the progress of an existing partnership, or to compare the probable rate of progress of a proposed partnership, relative to a non-partnership alternative.

We had originally planned to document the proportion of restoration projects in a watershed that were attributable to the work of the partnership as opposed to other initiatives. Reliably measuring this proportion proved to be much more difficult than we anticipated.

Future research might try to compare each of our 50 partnership-occupied watersheds to comparable non-partnership watersheds. Conceivably, a private foundation could investigate this question experimentally by initiating and funding partnerships in a large sample of randomly selected watersheds.

**Objective 3**

"To compare the strengths and weaknesses of the three theoretical frameworks"

Findings: To systematically compare multiple theories—each with multiple hypotheses—will require more statistical degrees of freedom than are available in our current sample of 50 partnerships. Once we have completed 80 case studies in the Fall of 2002, we can address this objective more thoroughly.

In the meantime, we can draw several theory-related conclusions from the results summarized under Objective One. For example, we found very mixed support for the importance of variables emphasized by the Alternative Dispute Resolution (ADR) Framework. Broad representation is positively related to at least on measure of success, as predicted, but local leadership was unexpectedly associated with lower levels of success, and the quality of facilitation and coordination was associated positively with some success measures, and negatively with others.

The three most important predictors of success (trust, funding, and time) are emphasized by multiple theories.

Finally, a factor analysis presented in our full literature review (Leach and Pelkey 2001), but not included in this report, found modest support for the importance of variables identified by the ADR Framework and the Institutional Analysis and Development Framework.

## Objective 4

"To provide concrete guidance to agency managers about how they might assist local partnerships"

Findings: The one result most directly relevant to state and federal agencies is the importance of non-local leadership. That is, success in terms of reaching agreements and implementing projects depends on active participation by state and federal agencies.

It seems plausible that agency participation is necessary in part because agencies can offer important resources such as scientific and technical information. However, the direct impact of technical information and expertise is ambiguous, at least over the observed range of variation.

The importance of adequate time means that agencies need to sustain their participation over many months.

Agencies can also play a major role in funding partnerships. When identifying potential funding recipients, agencies should look for ideologically diverse partnerships with high levels of trust and local representation (or that are making serious attempts to achieve trust and local representation.

## Objective 5

"To identify which watershed characteristics are most amenable to rehabilitation"

Findings: According to stakeholders' perceptions of success, partnerships have the most positive impact on the issues that stakeholders deem most serious: conflict among stakeholders, threatened species or habitat, and impaired water quality. This result suggests that partnerships devote more effort to serious problems, not less as had been suggested by some critics of consensus-based processes.

Stakeholders also perceive that their partnerships have been most effective at addressing problems that can be managed at a local or regional scale.

## Future research

The UC Davis Watershed Partnerships Project represents the most ambitious effort to date to compile detailed case studies of a relatively large number of partnerships using systematic methods of data collection and analysis. However, the WPP has two important limitations that could feasibly be addressed by future research.

First, because the research was conducted exclusively on the U.S. West Coast, it is unclear how well the findings would translate to regions of the country that differ in terms of traditions of civic engagement, trust in public officials, education, wealth, environmental ideology, or other factors that could influence success. We would like to replicate the study in other states where the variation on some of these factors might well exceed the range observed in California and Washington.

Second, one of the most serious limitations of the existing body of research, including the WPP, is the lack of longitudinal data. Repeated-measures over time are necessary for directly assessing changes in a given partnership. Evaluating impacts on social and ecological conditions in the watershed requires, at minimum, knowledge of whether these conditions have improved or deteriorated since the partnership's inception. Although it is possible in a cross-sectional study to measure the stakeholders' perceptions and recollections about events in the watershed, a repeated-measures design permits much more accurate measurement of temporal trends. Furthermore, cross-sectional studies can provide only correlations among variables, whereas longitudinal studies can reveal precisely which variable cause which outcomes.

The WPP could become a longitudinal study by revisiting each partnership at a 3-to-5-year interval. Repeating the interviews and surveys would provide a record of how (a) the structure and function of each partnership changes with time, (b) how the attitudes and perception of each stakeholder evolve throughout the process, and (c) how each partnership progresses on each of the six evaluation criteria.

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# APPENDIX B *LIST OF PUBLICATIONS AND PRESENTATIONS*

**Publications**

Leach, William D. 2002 (in press). Surveying diverse stakeholder groups. *Society and Natural Resources*.

Leach, William D. and Neil W. Pelkey. 2001. Making watershed partnerships work: A review of the empirical literature. *Journal of Water Resources Planning and Management.* Nov/Dec 127(6):378-385

**Under Revision**

Leach, William D., Neil W. Pelkey, and Paul A. Sabatier. Stakeholder partnerships as an emergent form of collaborative policymaking: Evaluation criteria applied to watershed management in California and Washington. *Journal of Policy Analysis and Management,* resubmitted Jan. 2002.

Leach, William D. and Neil W. Pelkey. Federal environmental law and collaborative watershed management. *Journal of the American Water Resources Association*

**In Preparation**

Sabatier, Paul A., William D. Leach, and Neil W. Pelkey. 2002. Theoretical frameworks explaining partnership success. To appear in *Swimming Upstream: Collaborative Approaches to Watershed Management.* Paul A. Sabatier, et al., MIT Press.

Sabatier, Paul A., William D. Leach, and Neil W. Pelkey. 2002. Conceptualizing, Measuring, and Explaining Success in Watershed Partnerships. To appear in *Swimming Upstream: Collaborative Approaches to Watershed Management.* Paul A. Sabatier, et al., submitted to MIT Press.

Weible, Chris M. and Paul A. Sabatier. 2002. History of Watershed Management in the U.S. To appear in *Swimming Upstream: Collaborative Approaches to Watershed Management.* Paul A. Sabatier, et al., submitted to MIT Press.

Sabatier, Paul A., et al. 2002. Lessons Learned. To appear in *Swimming Upstream: Collaborative Approaches to Watershed Management.* Paul A. Sabatier, et al., submitted to MIT Press.

Leach, William D., Neil W. Pelkey, and Paul A. Sabatier. 2002. Stakeholder-based watershed management: Lessons tested.

Weible, Chris M., William D. Leach, and Paul A. Sabatier. 2002. Perspectives on Watershed Partnerships: The Who's and Why's of Participation.

Leach, William D., Chris M. Weible, and Paul A. Sabatier. The devolution of natural resource management: Have national environmental groups been left behind?

**The WPP Workshop** — Sixty interviewees and friends of the project came to UC Davis on October 22, 2000 to learn about our findings and to help us interpret the results.

**Presentations / Outreach**

"Stakeholder partnerships as an emergent form of governance." Public Policy Institute of California, San Francisco, December 13, 2001.

"Making watershed partnerships work: Lessons tested." The Maxwell School of Syracuse University, October 15, 2001

"Evaluation criteria applied to watershed management in California and Washington." *National Workshop on Understanding Community-Based Collaboratives,* Las Vegas, August 6-8, 2001.

"Interim report on the Watershed Partnerships Project." Presented to the Assistant Secretary for Watershed and Salmon Restoration, The Resources Agency, State of California, Sacramento, July 5, 2001.

"Making watershed partnerships work: Trust, time, conflict, structure, process." Kennedy School of Government, Harvard University, May 3, 2001.

"Perspectives on watershed partnerships: The views of landowners, agency officials, and environmentalists." *Inaugural national policy conference on environmental policy in an era of devolution,* Ohio State University, Columbus, April 16-18, 2001.

"The UC Davis Watershed Partnerships Project." Poster presented at *Watershed Conference 2001: The Challenge of Collaborative Management,* University of California Extension, Sacramento, March 29, 2001.

"Explaining success and failure for 44 watershed partnerships in California and Washington." *Conference on Evaluating Environmental and Public Policy Dispute Resolution Programs and Policies,* The Maxwell School of Syracuse University, Indiana Conflict Resolution Institute at the Syracuse University Greenberg House, Washington, D.C., March 8, 2001.

"Federal environmental law and the formation of collaborative watershed partnerships." *Symposium on Integrated Decision-Making for Watershed Management,* Chevy Chase, MD, Jan 7-9, 2001.

"Keys to success in watershed partnerships: Approach and initial results." *Proceedings of the 8th Biennial Watershed Management Council Conference,* Pacific Grove, CA, November 29, 2000.

"Collaborative policymaking and implementation: The role of transaction costs and social capital." *Association for Public Policy Analysis and Management,* Seattle, WA, November 2, 2000.

"Conceptualizing and measuring success in watershed partnerships." *American Political Science Association*, Washington DC, August 29, 2000.

"Survey results for the Yuba Watershed Council." Nevada City, CA, March 15, 2000.

"The impacts of social and ecological conditions on the likelihood of stakeholder-based resource management efforts." *Association for Public Policy Analysis and Management,* Washington DC, November 4, 1999.

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| Jim Quinn | Co-PI | Link to GIS data bases in ICE |
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| Bill Leach | Post-doc, Grad student | Daily supervision, interviews, analysis |
| Katherine Buchanan | Grad student | Daily supervision, interviews, analysis |
| Chris Weible | Grad student | Daily supervision, interviews, analysis |
| Beth Cook | Grad student | Interviews |
| Jared Ficker | Grad student | Interviews |
| Martha Turner | Researcher | Interviews |
| Steve Kropp | Researcher | Interviews |
| Sky Harrison | Technician | GIS technician |
| Tamara LaFramboise | Undergrad | Office manager |
| Erin Klaesius | Undergrad | Office manager |
| Maryann Hulsman | Undergrad | Office manager |