

Results of Community Deliberation About Social Impacts of Ecological Restoration: Comparing Public Input of Self-Selected Versus Actively Engaged Community Members

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Abstract Participatory processes for obtaining residents' input about community impacts of proposed environmental management actions have long raised concerns about who participates in public involvement efforts and whose interests they represent. This study explored methods of broad-based involvement and the role of deliberation in social impact assessment. Interactive community forums were conducted in 27 communities to solicit public input on proposed alternatives for recovering wild salmon in the Pacific Northwest US. Individuals identified by fellow residents as most active and involved in community affairs ("AE residents") were invited to participate in deliberations about likely social impacts of proposed engineering and ecological actions such as dam removal. Judgments of these AE

participants about community impacts were compared with the judgments of residents motivated to attend a forum out of personal interest, who were designated as self-selected ("SS") participants. While the magnitude of impacts rated by SS participants across all communities differed significantly from AE participants' ratings, in-depth analysis of results from two community case studies found that both AE and SS participants identified a large and diverse set of unique impacts, as well as many of the same kinds of impacts. Thus, inclusion of both kinds of residents resulted in a greater range of impacts for consideration in the environmental impact study. The case study results also found that the extent to which similar kinds of impacts are specified by AE and SS group members can differ by type of community. Study results caution against simplistic conclusions drawn from this approach to community-wide public participation. Nonetheless, the results affirm that deliberative methods for community-based impact assessment involving both AE and SS residents can provide a more complete picture of perceived impacts of proposed restoration activities.

Keywords Social impact assessment · Public involvement · Public deliberation · Community-based resource management · Ecological restoration · Salmon recovery

Introduction

Participatory processes for gathering information from residents about impacts on their community of proposed environmental management activities have long raised concerns about who participates and whose interests are represented (Allen and Gibson 1987; Burch 1976; Elsasser 2007; Poggie 1972; Soucy 2000; Redburn and others 1980;

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Young and Young 1962). Open public meetings, which traditionally have been the staple of public involvement, may incorporate a range of community interests, but the manner in which information is exchanged, who chooses to publicly engage, and the degree of deliberation that takes place are very different from other forms of public involvement (Halvorsen 2006; McComas 2001). Interviews with affected stakeholders offer an opportunity to obtain more detailed and sensitive information (Seidler 1974; Savatski 1981), but doing so within and across multiple groups of stakeholders is time consuming and sometimes problematic (Soucy 2000). Small group techniques using nominal and focus groups or the Delphi method offer smaller groups of stakeholders the opportunity to discuss impacts collectively and develop mutual understanding (Dryzek 1990, Parkins and Mitchell 2005; Fitzpatrick and others 2008, Webler and others 1995). Each approach has its strengths and weaknesses. This study examines the attributes of a modified-nominal group process, assessing its results to improve methods of public involvement that promote broad-based public deliberation for social impact assessment (SIA).

In the present research, interactive community forums (Becker and others 2003, Harris and others 2003) were conducted to solicit public input on proposals for recovering threatened and endangered salmon in the Pacific Northwest US. Individuals identified by fellow residents as most active and engaged in their community were contacted and asked to participate in deliberation about likely social impacts of proposed engineering and ecological actions. These individuals, who were considered to be highly knowledgeable about their communities, are referred to in this study as actively engaged (AE) informants. The interactive community forum (ICF) process provided for gathering the input of AE participants and, because the meetings were open to the general public as required by federal law, comparing their responses with those of community residents who chose to participate out of personal interest. We refer to this second group of individuals as self-selected (SS) participants.

In this paper, we examine results from ICFs conducted in a diverse sample of communities as part of the U.S. Army Corps of Engineers' (2011) salmon recovery environmental impact study. The analysis seeks to understand the contributions and utility of using AE informants in a public involvement strategy to complement "expert" assessment of social impacts from major ecological restoration efforts. We analyzed input of citizens attending the ICFs to assess the extent to which AE and SS participants identified different impacts, as well as any inherent bias of group ratings of the magnitude of impacts in the context of the salmon recovery issue. Specifically, this analysis examined the extent to which impact ratings and identification recorded

by AE discussion groups differed from those of SS discussion groups, in terms of both the perceived magnitude of community-level impacts and the diversity of kinds of impacts identified. In particular, to what extent did inclusion of AE participants and their key informant knowledge result in identification of a greater number and kinds of social impacts?

Recent Literature

The US National Research Council's (2008) review of research on public participation in environmental management processes reaffirmed that approaches to public participation influence the quality of its outcome, and that research on participatory processes has "lagged far behind the need" (238). That report prioritized the need for creating analytic-deliberative involvement processes (Tuler and Webler 1999) and assessing their efficacy in terms of the types of individuals who participate. In particular, it highlighted the lack of rigorous comparisons of different participation formats, the extent they are bounded in terms of who participates, the influence of the diversity of participants on process and outcomes, and potential tradeoffs between representativeness and intensity of participation.

Assessing methods of inclusion and participation of diverse community members in deliberative processes is especially important when using local knowledge to assess major restoration project alternatives and potential social impacts (Allen 1998; Blahna and Yonts-Shepard 1989; Endter-Wada and others 1998; Stewart and Sinclair 2007). Participatory approaches to obtaining input for restoration planning based upon residents' unique insights about community structures and functioning (Becker and others 2003, Harris and others 2003; McComas 2001; Stronza and Gordillo 2008; Petts 2003) call for inclusion of diverse community interests so that perspectives and concerns of the broader community are considered and recorded (Bauer and Thomas 2006; Burningham 1995; Fiorino 1990; Renn and others 1995; Stolp and others 2002). This focus, moreover, is reflected in recent concerns about advancing more participatory approaches to SIA, as well as to other broader environmental assessment and resource planning processes (Bauer and Thomas 2006; Fitzpatrick and others 2008; Saarikowski 2000).

Many issues have been raised concerning meaningful, effective participatory approaches to SIA (Stewart and Sinclair 2007). The most common technique for involving the public in environmental management is the traditional public meeting that is unbounded and open to all parties, and most research on meeting participants and obtaining their input has focused on this approach. Extensive research reviews (e.g., Halvorsen 2006; McComas 2001;

Reed 2008; Rowe and Frewer 2005) note that public meetings have long raised concerns over the quality of citizen input and inclusion of a full range of all stakeholder perspectives. Research indicates that individuals attending public meetings or providing input on proposed activities tend to be older, Caucasian, more affluent, and more educated; they are more likely to be male than are community members in general; and they also tend to have greater status and power within their community, and to hold different beliefs and values than community members in general (Anthony and others 2004; Halvorsen 2006; Marshall and Jones 2005; McComas 2001). Even among demographically similar groups, public meeting participants can differ from nonparticipants in their viewpoints and concerns (McComas 2001; McComas and Scherer 1998).

In general, this body of research illustrates the problematic nature of self-selected participation, the extent to which diverse public interests are represented, and whether some citizens should be speaking for others—and thus the fairness and legitimacy of the public meeting approach (Grundy and Heberlien 1984; Halvorsen 2006; Heberlien 1976; McComas 2001; Stewart and Sinclair 2007; Webler and Tuler 2000). In particular, diverse input can be important to broadly capture residents' perceptions of likely socio-ecological impacts from proposed projects in rural parts of the United States, especially where communities are transitioning from traditional resource-based economies (Blahna 1990; Smith and Krannich 2000; Stronza and Gordillo 2008). The influx of newcomers in these communities can bring new understandings and concerns that significantly differ from those of "old-timers," who are more likely to represent long-standing, more traditional knowledge bases and concerns.

An alternative approach to public meetings described in the National Research Council report, as noted above, is an analytic-deliberative process that solicits public input by encouraging thoughtful dialogue about types and magnitude of impacts. Unlike traditional public meetings, where the flow of information is predominantly in one direction (either from the presenter to the audience or as a testimonial from the audience), deliberative processes employ small group techniques that encourage participants to share information and capitalize on the pooling of ideas and thoughtful consideration of diverse citizen viewpoints (Gigone and Hastie 1993). Theoretically, the sharing of information and discussion of diverse ideas in a structured group setting promotes the collective understanding of the consequences of proposed actions, enhancing the quality of participant judgments about impacts and thus improving the meaningfulness of public participation (Albrecht and Thompson 1988; Echabe and Castro 1999; Stewart and Sinclair 2007; Stewart and Stasser 1995; Welton 2001). Deliberative involvement processes that include discussion

among diverse participants, as well as between participants and officials, are widely held to promote free, open, and more meaningful dialogue about differences and commonalities in concerns (Becker and Others 2003; Harris and others 2003; Fitzpatrick and others 2008; Parkins and Mitchell 2005; Tuler and Webler 1999; Webler and Tuler 2000). The complexities of science-informed resource management recommend that, if participants are to engage in social learning about a project and provide more informed input, they discuss their knowledge of their community, exchange perceptions of resource management proposals, and work toward a common understanding of conditions and likely project outcomes (Petts 2003; Stewart and Sinclair 2007; Woodhill 2004).

In the present research, deliberative small group processes were used in community forums that employed a set of communication and recording techniques for exposing residents to a diversity of ideas, stimulating discourse, and gathering citizen input about salmon recovery proposals. The effectiveness of the ICFs in promoting broad community input are examined, and in particular differences between the input of residents participating in the AE groups and that of SS individuals.

We also would note that research has long recognized the possibility that some individuals may be more helpful than others for accomplishing meaningful public involvement, whether because they have specialized knowledge in certain areas of community life or because they are able to speak to diverse or sometimes neglected interests of the community (Allen 1998; Cheng and Mattor 2006; Elsasser 2007). In rapid community appraisals, for example, soliciting input of participants highly involved in community affairs can provide in-depth understanding of key informants' views and perceptions (Mostert and others 2007; Muro and Jeffrey 2008). Carefully selecting a diversity of individuals as key informants (Seidler 1974) or community leaders (Savatski 1981), based on their identified levels of knowledge, can help minimize selection bias and provide more informed and broad-based input. Nonetheless, the input of any segment of a community's citizenry must be carefully considered to ensure that participants selected do not distort outcomes or affect decisions in ways favoring their personal interests (Poggie 1972; Presthus 1964; Soucy 2000).

Significantly, while literature like that above addresses some best practices for deliberative public involvement, it is generally lacking in empirical studies directly examining the types and quality of contributions from key informants. The data and analyses presented in this paper were gathered with an IFC approach that represents a combination of the public meeting and key informant approaches—one designed to adhere to open public meeting laws while providing broad-based input for the U.S. Army Corps of Engineers' SIA.

Methods

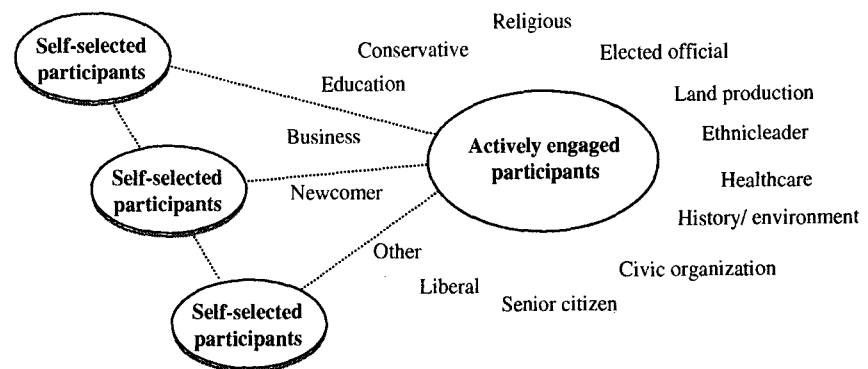
The data used in this analysis were gathered for a study of the community impacts of proposed salmon recovery efforts in the Snake River basin in the Pacific Northwest United States (Becker and others 2003). As part of the U.S. Army Corps of Engineers' (2002) EIS projected social impacts were identified by AE and SS community residents who recorded their judgments about anticipated effects on their community of three proposed salmon-recovery alternatives (no action, fish bypass improvements, and dam removal). Judgments of 705 individuals were collected in 27 community forums delineated across each of the proposed salmon recovery alternatives and four comprehensive categories of community conditions and capacity, including the community's social make-up (People), its jobs and wealth (Economy), its character (Place), and its organizational and leadership capacity (Vision and Vitality).

A set of small-group, interactive participation techniques (Delbecq 1975; Devine 1999; Stewart and Stasser 1995) were applied in each community forum to expose residents to a diversity of information about the proposed alternatives and to then promote dialogue in facilitated-discussion groups. A five-step process was employed for soliciting judgments about each salmon-recovery alternative. In the first step, participants provided numeric ratings of their community's current (baseline) situation across each of the four dimensions, based on a scale ranging in values from 1 (the most negative situation for the community, one that was "as bad as it could be") to 10 (the most positive situation that was "as good as it could be") for each community dimension. In the second step, a formal presentation provided participants with the latest scientific information about each salmon recovery alternative, followed by a question-and-answer dialogue. In the third step, participants considered the scientific information and provided a preliminary judgment of community impacts relative to their baseline assessment, rating impacts with a scale ranging from -5 ("the most negative, adverse impact in 2020 possible") to 5 ("the most positive, beneficial impact in 2020 possible"); the midpoint was designated as reflecting the maintenance of current, or baseline, conditions into the future. In the fourth step, researchers facilitated discussions within each group to pool information from group members and clarify one another's presumptions about likely changes across the delineated community dimensions. In the fifth step, participants provided a final individual numeric rating of the magnitude of anticipated impacts, followed by participants' listing of three qualitative justifications for those ratings. These numeric ratings and qualitative justifications, organized by group type, are the data used in our analysis here.

As part of that analysis, participant justifications for their numeric ratings were categorized by accepted content-analysis procedures and aggregated for the AE and SS discussion groups in each community, which produced categories representing the same specific kinds of impacts across group responses. After responses were classified based on these categories of impacts, this classification was cross-checked by a second, independent researcher for peer-reliability. In the event of disagreement, the two coders came to consensus on appropriate classification.

Invited AE residents attending each community forum were assigned to one AE discussion group, and the SS residents were assigned to separate discussion groups. Some 14 roles representing categories for various key socio-economic and cultural spheres of community affairs (e.g., education, business, healthcare, land production, etc.) were a priori identified from the literature and applied to ensure a diversity of participants in each group (Fig. 1). AE participants were first identified through a snowball-sampling approach (Miles and Huberman 1994), whereby five strategically selected individuals within each community were contacted and asked to identify three fellow residents who were most active and involved as community members in each of the 14 community roles. These residents were then contacted and asked to also identify three fellow residents most active and engaged as community members in their specific community role. The resident who was named most frequently by fellow residents as being most active and engaged in their community in that role was invited to participate in the community forum for a given role. AE discussion groups ranged in size from eight to 12 residents and were organized to maximize group diversity across the 14 roles. SS individuals, who were self-identified as being active in one or more of the 14 community roles upon entrance to the community forum, were randomly assigned to an SS discussion group; this assignment sought to maximize representation across the 14 community roles in any one discussion group (Fig. 1), thereby promoting a diversity of perspectives and community knowledge in each SS group.

Implicit in this research approach was the premise that diverse actors from across a community, as represented by AE residents, would have perspectives, knowledge, and perceptions that differed from those of SS residents. In the following analysis, we test our propositions that the range of community impacts sufficiently identified by the AE group would include SS identified impacts, but that the AE group would identify a wider range of impacts. This analysis focuses on responses to the proposal to remove four major dams in the lower Snake River basin; as the planning proposal having the greatest potential to threaten status quo interests, it was the most divisive and controversial when examining differences in AE and SS group

Fig. 1 Community roles in the interactive community forum discussion groups**Community Role Replication**

projections of community impacts. Consequently, we also posited that the magnitude of these social impacts would be more extreme among SS participants (whether positive or negative) because of the possible influence of the interests and advocacy associated with SS participants. We examined this third proposition by comparing aggregate SS group ratings of the magnitude of impacts with those of AE group ratings.

Analyses and Results

Comparison of Group Ratings

Given that data were collected from individual citizens as they participated in either AE or SS groups at the 27 forums, the individual participant by type of discussion group (AE, SS) was the primary unit of analysis for comparing participants' ratings of the magnitude of community impacts. To test the proposition that SS group rating scores of those impacts significantly differed from AE participants' scores, the scores for the two types of participants

were compared for each of the four dimensions of community life (People, Place, Economy, Vision and Vitality). Because the numeric ratings of the impacts of this alternative in all of the forums were predominantly negative (between -1 and -5) and thus not normally distributed, a nonparametric Mann Whitney U test was used to compare the rankings of the interval-scale ratings for each community dimension. The results in Table 1 indicate that the ratings of the SS participants were substantively more negative than the ratings of those of AE participants (statistically significant, $P < 0.05$). In support of the proposition of differences by type of participant, mean values for SS group participants' ratings across all 27 communities indicate that, overall, these participants rated the dam removal alternative as having significantly greater negative impacts than did the AE participants.

Comparison of Group Diversity and Justifications: Case Study Comparison

Comparison of qualitative justifications listed by the AE and SS group members for their ratings across each of the

Table 1 Comparison of active/engaged and self-selected group ratings by community dimension ($n = 27$ communities)

Community dimension	Group type	Descriptives		Mann-Whitney U Exact sig. (1-tailed)
		Mean ^a	Standard deviation	
People (social make-up)	AE	-1.94	2.89	0.044
	SS	-2.31	2.97	
Economy (jobs and wealth)	AE	-2.17	3.02	0.026
	SS	-2.49	3.15	
Place (character)	AE	-1.87	2.99	0.015
	SS	-2.37	2.95	
Vision and vitality (organization and leadership)	AE	-1.80	3.08	0.055
	SS	-2.25	2.99	

AE active/engaged group participants, SS self-selected group participants

^a Mean scores for impact ratings on a scale from -5 ("the most negative, adverse impact in 2020 possible") to 5 ("the most positive, beneficial impact in 2020 possible"), aggregated across all participants in a given group type (AE or SS)

four dimensions of community identified differences and similarities in the groups' recording of likely social impacts of the dam removal alternative. Given that this specification of community impacts was analyzed by type of group (AE or SS), the group was the unit of analysis for comparing the *similar* and *unique* impacts recorded by the AE and SS discussion groups; responses of all AE participants in a forum were aggregated as a group, as were those of all SS participants. Impacts identified by both the AE and SS groups in a given community were recorded as *similar* impacts, while impacts identified by only one of the two types of group were designated as *unique* impacts.

Because of the breadth and depth of data across all 27 communities (by community dimension and salmon recovery alternative), only two communities and their responses to the dam removal alternative are examined here as case studies. The two communities selected were similar in being small rural towns located in the same general region of central Idaho; however, one was a dry-land *agricultural community* perceiving significant negative impacts from dam removal, while the second was an upriver *multiple natural resource community* in transition from forestry to an amenity-based economy that could benefit from dam removal.

For both communities, we created and calculated a summative "diversity index" of values for variables that included community roles, occupation, age and gender, where community role was weighted most heavily because of its conceptual importance in the makeup of the AE and SS groups. Self-reported occupations were included to account for interests of types of occupational groups (e.g., farmers, fishers, and merchants) and differences in their views of social impacts. The groups might also differ in age cohort and gender, but these were weighted less than occupation because of the greater effect that occupational interests theoretically had on their impact assessments. Diversity of group members in terms of ethnicity, particularly in the rural communities assessed, was limited and therefore this variable was excluded from our index. A weighted diversity index was calculated by applying the equation below to AE and SS discussion groups:

$$\text{Group diversity} = ((\sum r_{ij} \div \sum p_{ij}) \times 3) + ((\sum o_{ij} \div \sum p_{ij}) \times 2) + (\sum a_{ij} \div 6 \text{ cohorts}) + (\sum g_{ij} \div 0.50)$$

- r* number of community roles in group
- p* number of group participants
- o* number of distinct occupations in group
- a* number of 15 year age cohorts in group (6 cohorts possible)
- g* percent females in group

- i* group *i*
- j* community forum *j*

Diversity index scores thus could range from a value of less than one to a maximum of 7.0. Three of the four types of discussion groups in the community forums were found to have relatively high degrees of participant diversity and a range of perspectives about the dam removal alternative, as discussed below (see Table 2). However, results of the analysis of these two communities as examples are only illustrative rather than representative of other communities.

We first examined the proposition that *similar* kinds of impacts would be reported among AE and SS groups having a similar diversity of community roles (and thus an assumed diversity of community perspectives and understandings). We also examined the proposition that AE residents would provide unique information about how their community would be affected by the salmon recovery alternatives. This proposed difference in *unique* impacts was based on the premise that AE participants collectively would possess more extensive community knowledge, leading them to identify a greater diversity of impacts to their community than SS participants—especially if the extent and diversity of roles represented in each group significantly differed.

The Multiple Natural Resource Community

The multiple natural resource community we examined in greater depth had experienced a major loss in timber-related manufacturing and employment in the recent past, and it was transitioning to an amenity-based economy with increased tourism and in-migration of retirees. If the Snake River dams were to be removed, the community would be directly affected by improvement in salmon and steelhead fisheries and related recreation. Barge transportation would cease, increasing transportation costs to export lumber and agricultural commodities.

The AE and SS discussion groups in the forum for this multiple natural resource community had a comparatively high degree of group diversity with diversity index scores of 6.08 for the AE group (7 participants; see Table 2) and 5.83 for the SS group (18 participants). Similar roles were represented in both groups, with the exception of education and ethnicity roles in the AE group that were not represented in the SS group, while representatives of civic and senior citizen organizations were represented in the SS group but not the AE group. The majority of participants in both groups were significantly older in comparison to the community-at-large (by about 15 years, on average) and male (by about 10 % in the case of the SS group, but 20 % in the AE group).

In this community forum, the AE and SS discussion groups identified 21 *similar* impacts common to both

Table 2 Comparison of group diversity for active/engaged (AE) and self-selected (SS) groups in a multiple natural resource community and an agricultural community

Group	Multiple natural resource community		Agricultural community	
	AE (<i>n</i> = 7)	SS (<i>n</i> = 18)	AE (<i>n</i> = 10)	SS (<i>n</i> = 28)
Community roles ^a	Elected official	Elected official Civic organization	Elected official	Elected official (2) Civic organization (4)
	Economic development	Economic development	Economic development	Economic development (5)
	Education		Education	Education
	Historic/ environmental	Historic/ environmental	Historic/ environmental	Historic/ environmental (2)
	Land-based production	Land-based production	Land-based production	Land-based production
			Liberal	
	Conservative	Conservative	Conservative	Conservative (4)
			Religious	
	Ethnic			
		Senior citizen	Senior citizen	Senior citizen
		Other active	Other active	Other active (4)
Occupations ^a	Auto dealer	Businessman	City mayor	Agriculture business agriculture consultant assistant manager
	Chiropractor	Business owner	Farmer/ rancher (4)	Contractor
	County commissioner	County employee	Grain elevator manager	Driver
	Housewife	Farmer	Office manager	Employment company
	Museum director	Fishery biologist (2)	Pastor	Excavating contractor
	Resource manager	Housewife	Retired farmer (2)	Farmer (13)
	State legislator	Motel owner		Farmhand (2)
		Nurseryman (2)		Fertilizer/ chemical sales
		Outfitter/ storeowner		Other
		Professional engineer		PC network specialist retired (2)
		Recreation specialist		Teacher/ lawyer
		Reporter/ photographer retired (3)		
		Secretary		
Percent males	71	61	90	82
Mean age	53	58	53	47
Diversity index ^b	6.08	5.83	4.50	2.82

AE active/engaged group participants, SS self-selected group participants

^a Numbers in parentheses are the total number of corresponding community roles or occupations represented within a group

^b Degree of group diversity is indicated with a weighted numerical “diversity index” based on the number of unique roles present, occupations, and distribution of age and gender; a high score on the diversity index represents a high level of within-group diversity

groups, of which only one was positive. Additionally, AE and SS group participants identified nearly the same number of total *unique* impacts on this community (16 and 14, respectively), as shown in Table 3 (see columns 1 and 6). Given the smaller number of participants in the AE group, however, the number of this group’s unique impacts *per person* was relatively greater (2.4 per participant) than was the case for the SS group (0.78 per participant).

Also, all but two of the unique impacts reported by the AE group were negative, while only half of the SS group’s unique impacts were. The results indicate that the AE group provided a comparatively greater number and

diversity of unique negative impacts, specifically for the Economy, Place, and Vision and Vitality dimensions (col. 3 of Table 3, as compared with col. 8). In contrast, SS participants identified a diverse set of unique positive impacts for all four community dimensions (col. 7), especially for the Economy and Place dimensions. Taken together, both groups identified a greater range of community-level impacts than either group alone provided.

The numeric ratings of impacts also are interesting in relation to the above results (col. 4 and 5 for the AE group, and col. 9 and 10 for the SS group). The mean ratings of the AE group in the multiple natural resource community

Table 3 Comparison of numbers of unique impacts identified by active/engaged (AE) and self-selected (SS) groups in a multiple natural resource community

Multiple natural resource community	AE group (<i>n</i> = 7)					SS group (<i>n</i> = 18)				
	Numbers of unique social impacts			Ratings summary ^a		Numbers of unique social impacts			Ratings summary	
	Total impacts (1) ^b	Positive impacts (2)	Negative impacts (3)	Mean rating (4)	Range of ratings (5)	Total impacts (6)	Positive impacts (7)	Negative impacts (8)	Mean rating (9)	Range of ratings (10)
People	0	0	0	−2.86	0 to −5	2	2	0	−1.83	2 to −5
Economy	6	1	5	−3.57	−1 to −5	7	5	2	−1.83	5 to −5
Place	6	0	6	−3.29	0 to −5	4	0	4	−1.78	5 to −5
Vision and vitality	4	0	4	−2.29	2 to −5	1	0	1	−1.89	4 to −5
Total unique social impacts (per person impacts)	16 (2.28)	1 (0.14)	15 (2.14)			14 (0.78)	7 (0.39)	7 (0.39)		

AE active/engaged group participants, SS self-selected group participants

^a Mean scores for ratings of impacts on a scale from −5 (“the most negative, adverse impact in 2020 possible”) to 5 (“the most positive, beneficial impact in 2020 possible”), aggregated across all participants in a given group type (AE or SS)

^b Column numbers

indicated its projection of more negative impacts for the four community dimensions (mean ratings ranging from −2.29 to −3.57; col. 4 of Table 3) in comparison to the SS group’s mean ratings (between −1.78 and −1.89; col. 9). Further, a range of somewhat more positive ratings (from 5 to −5; col. 10) was recorded for SS participants than AE participants, for whom a somewhat smaller range of ratings was found (between 2 and −5; col. 5). Thus, the inclusion of the SS group in this forum and the more positive ratings of community impacts of some group members resulted in the less negative mean ratings for this group.

The Agricultural Community

The agricultural community selected for this analysis was a town highly dependent on non-irrigated dry-land agriculture and government employment. Surrounding farms relied on the dammed Snake River to barge agricultural commodities to economic centers on the Pacific coast and abroad. As noted above, subsidized barge transportation would cease with dam removal, increasing costs for transporting agricultural commodities and supplies.

The AE group in this community had a much higher degree of diversity (a 4.50 diversity index score for 10 participants; Table 2) than did the SS group (an index score of 2.82 for 28 participants). The diversity score for neither group, however, was as high as the diversity scores found for the multiple natural resource community, indicating a more homogeneous group of participants in the agricultural community. Notable, however, is that the difference in diversity scores between the AE and SS groups was greater than in the multiple natural resource community. Unique

roles represented in the AE group included a resident active in liberal causes and a local pastor. Even though 18 more SS than AE participants attended the forum for this community, a civic organization representative was the only additional role represented in the SS group, which predominantly included farmers and other agriculture-related occupations. As in the other community forum, males dominated both groups and forum participants were on average older than the community-at-large, with the majority of participants in both groups significantly older, on average, than the average community member (by about 15 years) and male (by about 35 %).

In terms of *similar* impacts provided in the qualitative judgments of participants in this forum, both the AE and SS groups identified 32 impacts that were the same, and all of them were negative. In terms of *unique* impacts, Table 4 shows that, in contrast to the multiple natural resource community, SS participants in the agriculture community identified a substantively greater number of impacts (36) than did the AE group (13). However, although the SS group in this community was significantly less diverse relative to the AE group, its members nonetheless reported much the same extent of listing of unique impacts of dam removal *per person* as did the SS group (1.28 impacts per SS group member versus 1.5 per AE group member; Table 4, col. 1 and 6), specifically in the Economy and Place dimensions (about 0.5 per group member). Both AE and SS groups identified a smaller number per group member of unique impacts for the other two dimensions of this agricultural community (People, and Vision and Vitality).

Also, all but two of the unique impacts of dam removal reported by the AE group were negative (col. 2 and 3), while

Table 4 Comparison of numbers of unique impacts identified by active/engaged (AE) and self-selected (SS) groups in an agricultural community

Agricultural community	AE Group (<i>n</i> = 10)					SS Group (<i>n</i> = 28)				
	Numbers of unique social impacts			Ratings summary ^a		Numbers of unique social impacts			Ratings summary	
	Total impacts (1) ^b	Positive impacts (2)	Negative impacts (3)	Mean rating (4)	Range of ratings (5)	Total impacts (6)	Positive impacts (7)	Negative impacts (8)	Mean rating (9)	Range of ratings (10)
People	2	1	1	−2.60	0 to −5	1	1	0	−3.00	2 to −5
Economy	3	0	3	−3.10	−1 to −5	12	4	8	−3.89	1 to −5
Place	5	1	4	−2.70	0 to −5	13	3	10	−3.30	1 to −5
Vision and vitality	3	0	3	−2.80	−1 to −5	3	0	3	−2.65	1 to −5
Total unique social impacts (per person impacts)	13 (1.3)	2 (0.2)	11 (1.1)			29 (1.04)	8 (0.29)	21 (0.75)		

AE active/engaged group participants, SS self-selected group participants

^a Mean scores for ratings of impacts on a scale from −5 (“the most negative, adverse impact in 2020 possible”) to 5 (“the most positive, beneficial impact in 2020 possible”), aggregated across all participants in a given group type (AE or SS)

^b Column numbers

a substantial proportion (about one-third) of the SS group’s were positive. Despite this result, in terms of numerical ratings for this community, the SS group’s mean ratings of impacts for all four dimensions were more negative (between −2.65 and −3.89; col. 4) than the means for the AE group (between −2.60 and −3.10; col. 4), unlike what was found in the multiple natural resource community.

In sum, as in the multiple natural resource community, many *similar* negative impacts were identified between the AE and SS groups in the agriculture community, and the addition of the AE group increased the diversity of community-level impacts identified in the agriculture community. However, the nature of those impacts (i.e., whether positive or negative) differed for the AE and SS groups. While the AE group alone did not represent the full spectrum of impacts identified by SS residents, given the smaller size of the AE group, its members identified a similar per person number of impacts as the SS group. Also, the range of the SS group’s ratings in the agriculture community (2 to −5; col. 10) was greater than was reported by the AE group (−1 to −5; col. 5); in the results for this forum, however, the inclusion of the SS group and some more positive ratings of community impacts by the SS group did not result in more positive mean ratings, given the predominant highly negative ratings of many group members.

Discussion

The research presented here proposed that input about a major restoration project’s community impacts from groups of citizens actively engaged in their community in key roles would differ from the input of groups of citizens

actively engaged in their community in key roles would differ from the of groups of self-selected community members participating out of personal interest, in terms of both the perceived magnitude of those impacts and as the diversity of their listed qualitative impacts. As posited, the AE and SS groups across all 27 community forums differed in the magnitudes of their impact ratings, with SS participants overall more negative in their ratings and kinds of impacts described. These results are consistent with the findings of other studies (e.g., McComas and Scherer 1998) that self-selected participants are more negative in their perceptions of impacts.

One limitation of this analysis is that our comparisons between groups were based on input gathered after facilitated discussions. That is, we compared final ratings and justifications mediated by discussions, and we did not assess the effects of those exchanges. That analysis, which is beyond the scope of this paper, is the focus of another paper [Authors (In preparation)].

Interestingly for this analysis, although the SS groups in both case study forums also recorded a greater range of impact ratings in comparison to the AE groups, more variable mean ratings of impacts for that type of group were found. An outstanding question is whether these numeric ratings translated to differences in kinds of impacts group members reported as qualitative justifications? The present research explored the extent to which inclusion of AE participants, with their key informant knowledge, resulted in identification of a greater number and diversity of unique impacts—in particular, positive versus negative impacts—than the SS groups. This result was not found for either the multiple natural resource community or the agricultural community. Not only were

nearly all the similar impacts recorded by the two types of groups negative, but so too were most of the kinds of unique impacts reported—except in the case of the multiple natural resource community forum's SS group, with its listing of an equal number of positive unique impacts.

These results are thus mixed, relative to our original propositions, suggesting that more in-depth comparisons of the AE and SS groups caution against simplistic conclusions drawn from the two community case studies. In-depth analysis of the case study results suggests that, at least in these communities, the extent to which similar results in terms of the qualitative justifications provided by AE and SS group members differed by the type of community. While only based on these two cases, the qualitative analysis of rating justifications indicated that, in the multiple natural resource community, the highly diverse AE group identified a greater number of unique negative impacts than did the SS group. In the agricultural community, the SS group, which had the lowest diversity of the four groups examined, identified a greater number of unique impacts than did the AE in that forum. Most of them were negative—not an unexpected result, given the SS group's homogeneity in its representation of agricultural-related interests.

In sum, the extent to which the groups reported both similar and unique community impacts was important in terms of affirming the value of including a purposively selected group of individuals in our forums. Findings related to the supposition that AE residents, with more in-depth information about their community, would identify different impacts from the salmon recovery alternatives, did not indicate that in either case-study community AE participants identified a full range of impacts that included all those impacts projected by the SS groups. In addition to perceiving numerous similar impacts, each group identified significant numbers and diversity of unique impacts.

SS participants in the agriculture community, in fact, identified more unique justifications than AE participants, despite relatively less group diversity (especially in comparison to both AE and SS discussion groups in the multiple natural resource community). This result runs contrary to the second proposition we examined. Given our supposition that SS groups would be more representative of economic interests and their importance for community wellbeing, SS group members not surprisingly generated more unique ideas around Economy and Place dimensions and, in particular, more nuanced discussion of impacts on the agricultural sector; in contrast, the unique impacts of AE group members, as community leaders actively engaged and operating in the realm of the Vision and Vitality dimension, also included a greater number of impacts focused on that dimension.

Significantly, SS participants were not found to be necessarily more negative in their judgments as indicated by

their qualitative justifications, but mainly in the magnitude of their ratings. Nor were AE residents found to necessarily adequately represent the full range of interests and concerns of all forum participants; however, despite the smaller sizes of the AE groups, they identified many of the same impacts identified by SS groups.

The most important finding of our study, then, is that AE and SS groups together identified a greater range of impacts in both communities than would have been identified and considered had the AE group members not been invited to participate. However, as with all case study designs, these results cannot be viewed as representative of all affected communities. In a similar vein, this study did not address whether the ways AE residents view and understand their communities inherently differ from those of non-participating residents who may be less active and involved in their communities—in particular, from the perspectives of residents who feel powerless to make a difference, or who for one reason or another (e.g., lack of time, time conflicts) cannot participate in extended public involvement processes like community forums. Despite these limitations, the results are nonetheless useful in providing evidence of the complexity of assessing the results of deliberative approaches like the ICF process.

Conclusions

In 2008, the National Research Council called for more research on public involvement processes (NRC 2008). This paper addresses that need with its comparison of the input provided in 27 community forums by two types of community residents, actively engaged and self-selected citizens, who were asked to identify likely social and economic effects of dam removal on the Lower Snake River.

Reviews of the literature (e.g., Muro 2008; Reed 2008; Rowe and Frewer 2005) note that research has presented evidence of positive, mainly “social-relational outcomes” and benefits of participatory public-involvement processes; these outcomes include citizens' increased understanding of management issues and knowledge about other stakeholders' roles and views (Cheng and Mattor 2006; Fitzpatrick and others 2008; Hayward and others 2007; Stewart and Sinclair 2007). The present research posited that these benefits can be realized more effectively with an analytic-deliberative process that enlists participation of residents already actively involved and engaged in their community and its affairs.

The process presented here, moreover, is one approach for expanding community participation in a public forum and including knowledgeable citizens who can advance decision-makers' understanding of community perceptions of likely social impacts. Inviting AE individuals selected specifically to tap a greater breadth of community roles and

experiences expanded not just the diversity of participants, but also the breadth and depth of the content of the input received. The structure of the community forums effectively obtained input from all participants based on a facilitated discussion and consideration of others' perspectives.

The analyses discussed here affirm that, at least in the two case study communities examined, AE participants identified most of the impacts identified by SS participants, and further, they suggested distinct community-level impacts that would have been difficult to identify using the traditional public meeting format. Carefully selecting and incorporating AE participants provided different results for the communities than if they had not been included. We cannot say the results fully reflect the diversity of perceptions and concerns of all stakeholders in the study communities, and we cannot attest to the accuracy of the impacts reported by participants. Nonetheless, given the expense and logistics of collecting fully representative data and the weaknesses of traditional public meetings, the ICF process examined here represents one viable option for increasing deliberation and pooling of information while adhering to open public meeting laws.

In conclusion, the research results presented here are important for furthering the development of resource management based on appropriate approaches to gathering public input in environmental planning and decision making. Increased representativeness of participants in a public involvement effort that more adequately reflects the full range of public views and concerns has long been a criterion for success of public involvement processes (Berry and others 1997; Heberlien 1976; Stewart and Sinclair 2007). The premise here is that deliberation among a wide cross-section of community members enhances the representativeness and relevance of the input considered by managers and planners, helping them gain greater understanding of the public's reactions to an environmental issue and proposed management responses to it. With deliberative methods that promote participation of both AE and SS residents in community-based impact assessment, land managers and policy makers can acquire a more complete picture of perceived impacts of proposed resource management activities. Broad representation not only enhances the utility and relevance of the input considered, but also promotes public perceptions of more legitimate involvement processes (McComas 2001) and better decision-making (Fiorino 1990). Approaches for obtaining as broad-based input as possible can help managers and planners achieve these ends while gaining better understanding of the public's reactions to an environmental issue and proposed management responses to it. In the present involvement effort, the inclusion of AE residents helped accomplish the goal of broadening the consideration of social impacts in the salmon recovery study by encouraging judgments of social impacts based on a deliberative process.

That said, participants in all groups were predominantly male and relatively older in age, which supports previous findings noted above about characteristics of typical participants. Moreover, the relatively negative responses of the AE groups suggest that they may have represented a more conservative segment of the community—perhaps due to their demographic characteristics or power status. These factors raise concerns about the extent to which group membership was as diverse as the community at large. Future research could assess in greater depth the extent to which the characteristics of participants, including their political leanings, community roles and personal interests, are related to differences in impact ratings and kinds of projected community impacts. One caution that also should be noted is that the AE and SS participants cannot necessarily be considered to be mutually exclusive in their interests (some AE participants certainly could be expected to have potential interests affected by dam removal); nonetheless, our contacts with AE participants indicated they likely would not necessarily have attended a forum and provided input without a direct invitation to do so. This issue, as well, could be viewed as a limitation of our study that was beyond the scope of the present study but should be addressed in future research. That said, our study findings affirm that inclusion of the AE groups resulted in increased citizen participation and elicited unique responses that both substantiated and broadened the range of those diverse impacts identified by citizens who self-selected to contribute to this participatory impact assessment.

As concerns over the weaknesses of past comprehensive, top-down, technocratic approaches to resource decision-making have grown, managers and planners have increasingly turned to analytic-deliberative processes to aid them in accomplishing management responses to changing environmental conditions, which will likely grow in complexity as socio-ecological issues become more pressing. Research to enhance these processes needs to progress in-kind, if the potential for advancing effective public involvement and social adaptation is to be realized, thereby helping communities better meet the growing challenges they face.

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