

RESEARCH ARTICLE

The role of trust in restoration success: public engagement and temporal and spatial scale in a complex social-ecological system

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The social dimensions of river restoration are not well understood especially in the context of large-scale restoration projects embedded in a complex social-ecological system. This study used in-depth interviews with diverse stakeholders to examine perceptions of restoration success on the Clark Fork River Superfund project in Western Montana. Trust emerged as critical to restoration success and was influenced by public engagement, and by spatial and temporal scale. At this large scale, multiple relationships between agencies, NGOs, businesses, landowners, and other stakeholders meant that building trust was a complicated endeavor. The large spatial scale and long time frame made public engagement challenging, and landowners in particular were critical of the project, expressing mistrust in both agencies and the project as a whole. However, projects focused on smaller spatial scales, such as particular stream reaches, appeared to inspire more effective collaboration. Relationships between organizations were important at this large scale, but inter-organizational conflict affected trust across the project. Further, because trust requires accepting vulnerability, recognizing the differential vulnerability that particular groups and communities experience, based on the risks and benefits they accrue relative to the project, is important.

Key words: Clark Fork River, collaboration, inter-organizational conflict, Superfund project

Implications for Practice

To build trust in a complex social-ecological system, restoration practitioners can:

- utilize multiple forums for engagement and communication, from one-on-one interactions to larger public meetings;
- engage the public and key stakeholders (such as landowners) at the outset of the project when key decisions are still being made;
- ensure that public engagement offers meaningful opportunities for dialogue and for influence over both the process and outcomes of the project;
- build strategies to sustain public engagement over long time frames and communicate openly about delays
- utilize small-scale pilot projects to demonstrate success and build relationships.

Introduction

Large-scale restoration projects are nested in complex social-ecological contexts; yet, the social dimensions of river restoration are not well understood (Hull & Gobster 2000; Higgs 2005; Bernhardt et al. 2005; Christian-Smith & Merenlender 2010). According to Baker et al. (2014, p. 518), restoration “needs to be understood not only as a technical task but as deeply embedded in social and political processes.” Researchers have argued that shared values, public acceptance,

and stakeholder participation are “vital” to restoration success (Hobbs 2007; Woolsey et al. 2007). Using in-depth interviews, this project examined the social dimensions of a complex social-ecological system (SES), the Upper Clark Fork River in Montana, a Superfund cleanup project involving multiple agencies, communities, landowners, businesses, and non-governmental organizations (NGOs)—one of the largest river restoration efforts ever attempted. In the context of this SES, trust emerged as critical to restoration success and interactions between trust, spatial and temporal scales, and public engagement were particularly important. These insights are relevant for restoration ecologists and managers because trust appears to influence project success.

Literature Review

In natural resource management, trust has been posited to reduce conflict, encourage cooperation, decrease costs, lessen uncertainty, and help decision-makers navigate the interests

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Table 3. Selected quotes on trust.

| Category | Selected Quotes |
|------------------------|---|
| General trust | If you have long-standing conflicts or mistrust that can also certainly be a barrier. (Agency staff). He's (the chairman of the local landowner group) trusted by everybody, on the agency side, and then the rancher side, 'cause everybody knows he's gonna come at it from a ... very balanced ethical, point of view. (NGO staff) The trust and the credibility, anything we do in life, when you start getting credibility, the oversight (of this particular agency by the EPA) goes down, with trust. (Agency staff) |
| Building relationships | You've established these relationships with clients and they start to trust you and rely on you. When you're a business, a consultant, that's probably the most important thing you can do. (Restoration business) Sooner or later you've got to start trusting people and believing in people and taking it upon yourself. Maybe it's my attitude that needs changed. Maybe I'm the stick in the mud. Maybe I need to relinquish a little. (Landowner) |
| Trust and landowners | <i>Regarding a previous decision to purchase private property:</i> I'm expecting it to take time to get relationships with the landowners ... we pissed off the whole drainage. Now we have to go in there and say, "Trust us." We kind of shot ourselves in the foot. Hopefully we're rebuilding from that a little bit. We're trying to. (Agency staff) The people (from a particularly government agency) we work with in Deer Lodge, the actual individuals, some of them have been there for 15 or 20 years and they know the landowners extremely well, and they have a good level of trust with landowners. (NGO staff) The other thing that's upsetting is, when they had the meetings down here and said they were thinking about it and they wanted public input, it was already done by the time that they started the public input deal ... They didn't give a rap what you said. It was done. It was a done deal. (Landowner) |

particular, spatial scale introduced complexities that meant that the development of trust was both important and difficult. The scope of the project, variation in communities, and conflicts between agencies presented challenges to building trust. Many participants acknowledged the difficulty of working on projects at this scale and magnitude. As one agency official stated, "no river restoration, I don't think, of this magnitude has happened before in the country." The scale of the project made it important to develop a "coherent strategy" so that the end result was not "a thousand random acts of restoration." In some instances, bridging organizations and the use of smaller-scale projects to demonstrate success helped build trust. In addition to the data provided below, additional quotes on spatial scale can be found in Table 4.

Given the large scale of the Upper Clark Fork, differences in communities came into sharper focus. Communities on the Upper Clark Fork differ culturally, economically, and politically, with different vulnerabilities to harm as well as different capacities to take advantage of benefits from restoration. These differences influenced relationships, communication, collaboration, and ultimately trust. For example, the Milltown Dam removal was situated in the politically progressive, mid-size college town of Missoula, and despite the "very complex project" and "multiple stakeholders," restoration in this area was seen widely as a success. While dam removal was contentious at the outset, city and county governments, numerous NGOs, state and federal agencies, and several large private contractors were able to negotiate a project that had broad buy-in. Meanwhile, in Opportunity, the community on the receiving end of the toxic sediments behind Milltown Dam, residents asked DEQ officials "where's our pretty picture?" referring to the beautiful drawing used to depict the Milltown area post-restoration. Instead of improved ecosystem services,

tiny Opportunity would have an even larger pile of mining waste, owing to "decades of being abused as a community." Situated between Milltown and Opportunity, ranchers in the Deer Lodge Valley worried that remediation and restoration work might reduce acres available for grazing on their property over the short-term, negatively impacting their livelihoods. Each of these communities experienced vulnerability relative to the project and project managers in different ways, influenced by their perception of costs and benefits, and their power to engage decision-making. Because trust hinges on an acceptance of vulnerability, different vulnerabilities may help explain different trust relationships. One-way individuals navigated the large spatial scale was to create and work through bridging organizations in order to access the decision-making process and influence the outcomes of the project. For example, the legal settlement for the Upper Clark Fork established the Clark Fork River Technical Advisory Council (CFRTAC), whose role was to serve as a bridging organization to engage the public in the decision-making process and to disseminate technical information about the project. Current CFRTAC staff described their role as "giving a voice to the landowners" because they "don't necessarily trust DEQ or ... EPA." Another citizen's group, the Watershed Restoration Council (WRC), was established by a group of Deer Lodge landowners to serve a similar bridging function, coordinating landowners, helping them navigate and influence the process, and putting them in touch with relevant resources. A rancher reported that at one point, the EPA asked WRC to assist them in "meeting with landowners" and "explaining the process" because "they had landowners shutting the door in their face" whereas WRC was trusted by local landowners. Landowners recognized the power they gained through collaboration, suggesting that a "big public agency" "listens to a group of people" much more so than an "individual."

Table 4. Selected quotes on spatial scale and trust.

| Category | Selected Quotes |
|--------------------------------|--|
| Spatial scale and complexity | You also have to have a coherent strategy that guides your work. So, those elements are really important, otherwise we end up with what people refer to as a thousand random acts of restoration ... that's why I keep (a graphic representation of the strategy) right on my wall. (NGO staff) |
| Community variation | At Milltown ... there were a lot of people who were cynical about the cleanup and were negative. A lot of those people were changed over once they saw the work going on the ground, and saw the positive results. (NGO staff) |
| Role of bridging organizations | After this phase of the cleanup, most of it will be on private land, and that's where our focus really is; to give a voice to the landowners. Typically, the landowners on the river don't necessarily trust agencies. So it gives them more of a private voice. (NGO staff) They (a government agency) wanted our help (the help of the local landowners group) meeting with landowners, explaining the process. And they had landowners shutting the door in their face and everything else. They were afraid of what was going to be happening to them. So after several years, they had only talked to like 20% of the landowners. So they came to us for help. And we had the trust of them (the landowners) because we worked with them all the time and we are one of them. And so that was where we tried to help. And so we set up meetings and we worked with the landowners. (Landowner) |
| Small-scale projects | Developing trust through showing success with some of these other types of projects (small-scale pilot projects) is a good step toward accomplishing that goal (NGO staff) Yeah, and building trust, so that when the next opportunity comes up, you can point back to this pilot project. (NGO staff) |
| Interagency conflict | <i>Regarding the relationship between the two lead government agencies:</i> We are talking over each other and not talking to each other. I think that the Clark Fork River as it's currently proceeding is not a successful project. We have poor communication, we have a poor shared vision, we have poor respect for each other's roles and responsibilities. (Agency staff) My fear is that the upper river cleanup will stay entrenched, will continue to stay divided, and we won't learn what we should about how to make the Upper Clark Fork River function. I think there is a real opportunity there, and I think it (inter-agency conflict) does damage to personal relationships, to reputations of agencies all around, in the eye of the public. (Agency staff) |

Moving between scales also addressed the challenges of such a large project. In particular, many people suggested that small-scale pilot projects on private lands could provide examples of benefits to neighboring ranchers, "develop trust through showing success," and build "confidence" in project outcomes. These pilot projects functioned well in part due to their small scale. Some interviewees suggested that projects were more successful if they involved fewer landowners.

At the large scale, numerous state and federal agencies, and city and county governments needed to work together effectively for project success. A major conflict between two agencies illustrates the influence of these relationships on trust. Numerous interviewees described these agencies as "fighting," "feuding," and in "competition," and their "acrimonious" relationship was seen as eroding trust. The conflict was believed to emerge from differences in "institutional cultures," "priorities," philosophies, and interpretations of the Record of Decision, and "lack of communication." Personnel in these agencies hotly contested their roles and responsibilities. Different ideas about the safety levels of contamination and about the boundary between remediation and restoration also contributed to the conflict. One employee expressed concerns that the "public is kind of dissatisfied with the fact that the (two agencies) can't get along." This conflict contributed to the perceived time delays

in the project, further eroding trust, which is highlighted in the following section.

Temporal Scale

Many participants explicitly acknowledged that restoration efforts unfold over a long time horizon. People recognized that many of the ecological outcomes, such as changes in fish populations or the revegetation of riparian areas, would not be detectable for decades. Landowners and other stakeholders expressed frustration about delays in decision-making and implementation, and linked these frustrations specifically to declining trust, as illustrated in Table 5. People discussed the decade-long legal battle with ARCO and their frustration with the lengthy lawsuit. As this NGO employee stated, "the major shortfall of the Clark Fork River cleanup was ... the length of time it took to get through negotiations." Landowners also complained about waiting around for the "lawsuit to get settled."

More recent delays also eroded trust. Nearly all of the landowners in the Deer Lodge Valley conveyed frustration that project managers had approached them about beginning work on their land and then disappeared for many years without much explanation. As one landowner described, "you said this a long time ago. Years ago you were talking about this and you never

Table 5. Selected quotes on temporal scale and trust.

| <i>Category</i> | <i>Selected Quotes</i> |
|---|--|
| Frustration with time delays | <p>It takes time to get organized and get the funding, so years go by. By the time you get around to saying, “OK, let’s do it,” they’re saying, “You said this a long time ago. Years ago you were talking about this and you never did anything, so I don’t really trust you that much.” Unfortunately, that’s just how the process works. It takes a lot of time. (Landowner)</p> <p>If you say that you’re going to get on their land and be there in two years and you’re not, you lose faith. So those are just to gain that trust and not putting those false expectations out there. (Agency staff)</p> <p>I guess my worst fear is that maybe things won’t happen fast enough and opportunities will slip by. Land will be bought, subdivisions thrown up, before the state can acquire easements or buy the land, at least in the corridor, to protect it. (Tribal staff)</p> |
| Public engagement over long time frames | <p>We had the message strong that they were tired of going to meetings. They were tired of hearing about what somebody was going to do. They wanted to see something going. Very few people wanted to hear from us until we were doing something. (Agency staff)</p> <p>At a more personal level, you have to build trust one person at a time. And you have to be patient. It takes a lot of time. And you have to be careful that you don’t make any blunders along the way, because there are people looking for you to reveal your hand that you really don’t give a damn about agriculture and that all you want is to preserve fish and, if they (ranchers) go out of business, you don’t actually really care. (NGO staff)</p> |

did anything, so I don’t really trust you that much.” This lack of communication and delays in implementation led to decreased trust in project managers and an unwillingness to engage in the process. Landowners stated that they were “waiting around” and “wanting to get going” on the Superfund cleanup; however, the process kept “dragging on.” Agency and NGO staff also recognized that the delay was eroding trust. As this state employee explained, “if you say that you’re going to get on their land and be there in 2 years and you’re not, you lose faith.” Many landowners were uncertain whether, when, and how cleanup was going to happen on their property. Interestingly, landowners, NGO staff, and agency staff explicitly linked these delays to the agency conflict described above, suggesting that problems with interorganizational relationships were affecting trust relationships between other groups, especially landowners and agencies.

In this context, many participants argued that patience was critical to project success. As one NGO employee stated, “patience is key. You’ve got to have patience. Plants take time ... ecological systems take time, and they evolve over time ... the same with people and relationships ... you have to be really patient in this business.” In particular, people emphasized the time involved in building relationships and establishing trust, saying “you have to build trust one person at a time” to be successful. One restoration expert commented that “it takes long-term relationship building, and this is the human component of successful restoration.”

Public Engagement

As described in the literature review, public engagement influences project success, in part through building trust. Participants in this study discussed the importance of public engagement throughout their interviews. According to an NGO employee, “the community’s engagement and involvement with this (project), whether they accept or reject it, will determine

whether or not the restoration works.” Private contractors, agency employees, and landowners all discussed the need for meaningful public engagement. But assessments of the quality of public engagement were very mixed, demonstrating that saying public engagement is important and doing it well are two different things; quotes in Table 6 exemplify this difficulty.

Many participants viewed the public engagement related to the Milltown Dam portion of the project very positively. One tribal employee described NGO efforts, saying that they “have done a lot to make sure the public voice was heard and to get the public involved. I think it’s been one of the more outstanding processes I’ve ever been involved in.” An agency employee felt similarly, saying “It’s really been a good model, the extent of community engagement.” Public engagement and collaboration at Milltown were widely believed to have resulted in improved outcomes and a “good product.” Similarly, NGOs and landowners who were participating in small-scale tributary projects regarded them as successful collaborations.

However, some agency staff suggested that meetings were “counterproductive,” that continuously asking people for input could delay implementation, and that people were “tired of going to meetings.” As a result, some agencies and NGOs had shifted to tours, radio spots, and newsletters as mechanisms to disseminate information about the project. They described these one-way communication strategies as “outreach” and “educating” the public to “give them as much information as possible.” But not surprisingly, landowners complained that important project news had to be garnered via the newspaper, telling a story about a proposal for a nearby property that fueled frustration with a particular agency.

Many agency and NGO staff were focused on one-on-one meetings with landowners, to build relationships and discuss specific activities on their properties. Because landowner participation in restoration is voluntary (while participation in remediation is required), landowner “buy-in” was widely considered

Table 6. Selected quotes on public engagement

| Category | Selected Quotes |
|-------------------------------|--|
| General public engagement | <p>In this case (Milltown), just the public process that went into it, that's something that really resonates with me, and I feel it's been pretty solid. The county was really good about keeping people engaged. (Agency staff)</p> <p>Public engagement and interest and maybe the Clark Fork Coalition deserves a lot of that credit, because they've been in it for the long haul and have done a lot to make sure the public voice was heard and to get the public involved. I think it's been one of the more outstanding processes I've ever been involved in. (Tribal staff)</p> <p>With this phase . . . , instead of having public meetings, we had one. Now we're giving tours (of other landowner's property where the cleanup was happening). We have weekly radio spots, telling people where we're hauling, newsletters once a month. So it goes out there, but the community in the Deer Lodge and Anaconda area, they're not really engaged maybe like some other communities; they don't really want to go to meetings to hear things. They can go by and see. (Agency staff)</p> |
| Views on landowner engagement | <p>They (landowners) weren't involved in the process. I heard about it through the newspaper. They (the State) didn't even have the courtesy to drive to the few landowners that border and say, "We're thinking of purchasing this property." They didn't have that courtesy. (Landowner)</p> <p>There's fear of government control of their land and they can't do what they want with it . . . some people think they don't want the government telling them what to do with their property, they're very suspicious of government funding and grants and don't think the money should be spent that way. (Landowner)</p> <p>We want citizens to meaningfully engage, we need to (A), give them the organizational structure to form a group to engage, and (B) give back some money so that they can hire their own people to review technical documents to make sure that they're getting what they need out of the process. (Agency staff)</p> |

to be critical to project success. However, the landowners interviewed for this study, all working ranchers in the Deer Lodge Valley, were particularly critical of public engagement and skeptical of the project, based on their interactions with agency staff, the decision-making process, delays in implementation, and a general mistrust of government agencies.

More specifically, landowners suggested that agencies had decided how to proceed before soliciting public comment, saying that "they didn't give a rap what you said . . . it was a done deal." Landowners argued that they "should play a big part" and "should have some say," but described how they were "left out," saying that the agencies did not "consider the landowner in the whole process." One landowner claimed that he was called "ignorant" in a public meeting. Some landowners, agency staff, and NGO staff attributed some of the landowner skepticism to a "distrust in government," "suspicion," and "fear of government control," indicating that long-held antigovernment sentiment in the ranching community was influencing trust in the agencies involved in the Superfund project.

Many agency and NGO staff were aware of the failure to adequately engage landowners, calling the landowner the "missing element." One agency employee suggested that "active engagement from ranchers, from the beginning . . . would have been incredibly helpful . . . And so we're going to pay the price of that . . . as the cleanup goes along." Thus, despite widespread recognition of the importance of public engagement and the relationship between public engagement and trust, participants viewed engagement as very mixed, with successful collaboration on Milltown and small-scale projects on the tributaries, and

widespread failure to effectively engage landowners in the Deer Lodge Valley.

Discussion

Previous research on restoration has called for more in-depth investigation of the social factors that contribute to restoration success (e.g. Hull & Gobster 2000; Higgs 2003; Bernhardt et al. 2005; Christian-Smith & Merenlender 2010). In this study, a wide range of stakeholders on the Clark Fork River viewed trust as critical to restoration success. This finding is consistent with previous research focused on the role of trust in natural resource management more broadly (e.g. Davenport et al. 2007; Olsen & Shindler 2010; Sharp et al. 2013). Beyond the general importance of trust, we find that trust dynamics in the complex social-ecological context of large-scale restoration are linked to spatial and temporal scale, and public engagement.

In this study, assessments of trust were mixed; however; some participants and projects seemed to enjoy high levels of trust while others expressed deep mistrust and skepticism of key agencies and the project as a whole. Because trust involves an acceptance of vulnerability, different groups of people may experience trust (or mistrust) differently, based on the specific risks they encounter related to the project and their levels of engagement (Spink et al. 2010; Gray et al. 2012). We found that communities along the Clark Fork River were vulnerable in different ways, experiencing different harms (e.g. opportunity serving as the repository for the Milltown waste) and benefits (e.g. Milltown receiving a restored river) related

to the project. Similarly, Stern and Coleman (2015) suggest that “actors” within a system have differing degrees of vulnerability depending on their positions within the project and differences that can affect trust. For example, in the Deer Lodge Valley, where landowners expressed a deep mistrust of the project, concerns about livelihood impacts and lack of power in project decision-making were prominent. Consistent with Carvill (2009), antigovernment sentiment and concerns about livelihoods were influencing landowner’s trust in this valley. Previous research in other locations have also found that antigovernment sentiment and mistrust of government agencies can create barriers to project success (Davenport et al. 2007; Spink et al. 2010). Effective public engagement involving dialogue, deliberation, and integration of multiple perspectives may help address these barriers (Yung et al. 2013). The ability of effective public engagement and dialogue to build trust may explain why the smaller-scale tributary projects were widely regarded as successful.

Future projects in a complex system like the Clark Fork River may require new strategies that move beyond one-way communication and traditional public meetings to forums that truly involve affected communities and key stakeholders in the decision-making process. The kind of public engagement required to effectively build trust and include stakeholders and in dialogue and deliberation is particularly challenging at large spatial and temporal scales. Not only is it difficult to sustain relationships over long time frames, delays in implementation, revisions of project plans, and changes in key staff can influence trust. These sorts of shifts may leave many stakeholders feeling vulnerable. Further, the success of the small-scale tributary projects raises the question of how to effectively engage multiple stakeholders at the large scale of a project like the Clark Fork, or if trust at this small scale truly “adds up” to trust in the project as a whole.

The timing of public engagement in a long-term project is also critical. Landowners were not brought into the process early enough, contributing to their sense of disenfranchisement and pointing to the need for upstream engagement during the project development phase (Wilsdon & Willis 2004). Further, restoration in a large-scale SES involves a complex institutional landscape and myriad trust relationships between numerous stakeholder groups. For example, interorganizational conflict, which may be more likely given the institutional complexity of projects at large spatial scales, can ripple out to influence relationships with other stakeholders. In this study, conflict between two agencies was eroding trust more broadly, contributing to project delays and a loss of credibility.

As with any study, there are several limitations that should be acknowledged. First, the aim of this study was to understand the social factors influencing river restoration, not to specifically investigate the role of trust. However, trust emerged as a key social factor, indicating the salience of trust for project participants. But, because trust was not the focus of the study, interview questions did not focus exclusively on trust, which could be seen as a limitation. Future research focusing explicitly on trust in complex SESs can build knowledge of the dynamic role of trust in this context. Second, we interviewed a diversity

of stakeholders for this study. While that provides us access to many different perspectives on trust, it limits our ability to provide detailed comparisons between groups. Third, as with most case study research, some findings may be specific to this particular project at this particular moment in time. Longitudinal studies and cross-case comparisons can address this weakness.

Social processes may be as important as ecological processes in determining the success of restoration projects. Trust is likely a key social factor that influences both the process and outcomes of restoration. For large-scale restoration projects, building trust is particularly challenging given large spatial scales, long time frames, and complex social-institutional context. Multiple actors, differential vulnerabilities, and uneven public engagement all contribute to trust dynamics in complex SESs.

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