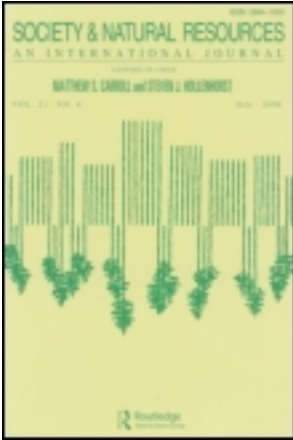


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Stakeholder Perspectives on Prospects for Co-Management of an Old-Growth Forest Watershed Near Valdivia, Chile

Michelle C. Moorman^a, Nils Peterson^a, Susan E. Moore^a & Pablo J. Donoso^b

^a Department of Forestry & Environmental Resources, North Carolina State University, Raleigh, North Carolina, USA

^b Facultad de Ciencias Forestales y Recursos Naturales, Instituto de Silvicultura, Universidad Austral de Chile, Valdivia, Chile

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Stakeholder Perspectives on Prospects for Co-Management of an Old-Growth Forest Watershed Near Valdivia, Chile

MICHELLE C. MOORMAN, NILS PETERSON, AND
SUSAN E. MOORE

Department of Forestry & Environmental Resources, North Carolina
State University, Raleigh, North Carolina, USA

PABLO J. DONOSO

Facultad de Ciencias Forestales y Recursos Naturales, Instituto de
Silvicultura, Universidad Austral de Chile, Valdivia, Chile

When human and financial resources are limited, who assumes responsibility for managing a country's protected areas? In Chile, government-owned protected areas lack sufficient management resources while facing extraction pressure from the rural poor. Multi-stakeholder partnerships have been posited as a co-management style alternative to traditional state-managed systems. This strategy is being tested in the Llancahue watershed near Valdivia, Chile. To understand stakeholders' views toward the formation of this multi-stakeholder partnership, we evaluated stakeholders' beliefs, positions, interests, and concerns. Results indicated stakeholders believed an adaptive co-management model could improve Llancahue forest and watershed conservation efforts if the partner roles were explicit, stakeholder involvement was inclusive, and appropriate financing mechanisms were determined. Stakeholders were most concerned with the financial, personnel, and legal costs of managing Llancahue. However, our analysis suggests the perceived benefits of halting illegal logging and creating a peri-urban park currently outweighed stakeholder concerns over project financing and institutional design.

Keywords adaptive co-management, Chile, decentralized conservation, protected area management, public-private partnerships

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Address correspondence to Michelle C. Moorman, 3916 Sunset Ridge Rd., Raleigh, NC 27607, USA. E-mail: mmoorman@usgs.gov

Most government-owned protected areas were designated as management solutions for forest, water, and biodiversity conservation under the assumption that ecosystem services were best protected when guarded from human impacts (Bruner et al. 2001; Kellert et al. 2000; Garcia-Frapolli 2009). Despite the ubiquity of protected areas, research has suggested they fail when the needs of adjacent communities are not considered and insufficient resources are allocated for management (Borrini-Feyerabend 1996; Berkes 2004; Elbers 2008). Paper parks, defined as parks protected on paper that have been degraded by poaching, overgrazing, and resource extraction due to insufficient funding for on-the-ground management, have typified this phenomenon (McNeely 1994; Armesto et al. 1996). Adaptive co-management has emerged as a form of decentralized conservation that embraces a complex, socioecological systems perspective and holds the promise of improving on-the-ground conservation in paper parks (Folke et al. 2007; Olsson et al. 2007).

The reality of paper parks has been clearly identified in Chile (Carruthers 2001; Pauchard and Villarroel 2002). Conservationists have acknowledged that threats including illegal logging and cattle grazing continue to occur in state-owned protected areas (Armesto et al. 1996; Lara et al. 2009). In 2005, 200,000 impoverished people lived on the fringes of forests and state-owned protected areas and were a threat to the forest (Emanuelli 2005). Spending for protected-area management (approximately US\$0.50 per hectare) has not been able to safeguard Chile's protected areas using the traditional state-managed model (Lara and Urrutia 2010). For these reasons, traditional land managers in Chile have been searching for a more effective model of protected-area governance and are turning to adaptive co-management models (Pauchard and Villarroel 2002; Rozzi et al. 2006). Adaptive co-management is a form of governance that involves actors who interact at multiple scales to solve problems, make decisions, and undertake actions (Carlsson and Berkes 2005; Berkes 2007; Fennell et al. 2008). The promise is that adaptive co-management can increase the flow of resources for protected-area management by spreading management costs and responsibilities amongst multiple organizations (Phillips 2003; Wettenhall 2003).

Plummer and Hashimoto (2011) have demonstrated that adaptive co-management strategies will be context dependent, synchronizing institutional and organizational landscapes in order to enhance the fit between systems. For the purposes of our research, adaptive co-management is being defined as a multi-stakeholder partnership. The multi-stakeholder partnership redefines the governance structure of the protected area from one controlled by the state to one that is co-managed by a diverse group of stakeholders including the private sector, nongovernmental organizations, and community members (Hall 1999). These multi-stakeholder partnerships are being implemented in response to the limited capabilities, reduced services, and minimal budgets that were a result of the state-run system (Moore and Weiler 2009). Among the 19 countries in Latin America and the Caribbean, Chile has been best suited to facilitate multi-stakeholder partnerships based on the country's legal, regulatory, institutional, and financial capabilities (Economist Intelligence Unit 2009). Multi-stakeholder partnerships have already been used to address public housing challenges (Stackhouse 2009). These national contexts suggest multi-stakeholder partnerships may improve management of the state's underfunded and undermanaged protected-area network (Borrini-Feyerabend 1996; Agrawal 2000; Mahanty and Russell 2002). Yet there have been few examples of how to implement these multi-stakeholder partnerships, so there is an acknowledgment among the partners that co-management of the protected area must be a learning process that is adaptive as it evolves.

The benefits of successfully implemented, decentralized conservation programs have included more effective management, better acceptance of management actions, improved environmental and social understanding, improved trust between stakeholders, reduced costs for enforcement, and increased public awareness (Pinkerton 1989; Borrini-Feyerabend 1996). Yet policy transfer to adaptive co-management can fail if the contextual uniqueness of individual socioecological systems is not understood (Dolowitz and Marsh 2000; Plummer and Hashimoto 2011). Assessing stakeholder interests and perspectives has helped improve partnership design and success (Grimble and Wellard 1997; Plummer and Hashimoto 2011) because the information reveals how stakeholders can contribute to or hinder the partnership process (Varvasovsky and Brugha 2000).

In this research, we conducted a stakeholder analysis of the Llancahue protected area (hereafter Llancahue) to understand the potential benefits, drawbacks, and challenges stakeholders associated with decentralized conservation. Llancahue functions as both a case study and a pilot for the use of multi-stakeholder partnerships as an adaptive co-management strategy in the context of Chilean conservation, especially for government reserves that protect municipal water supplies. The government is currently in the process of decentralizing management of several of its public reserves that function as water-supply watersheds for major cities in Chile. Currently, these reserves are not being protected by the state-run system and are threatened by local residents illegally grazing animals and harvesting forest resources within the watershed. In the following section, we have provided the socioecological context for why public reserves are being decentralized in Chile. We then present the results from our stakeholder analysis of prospective partners with the following research question in mind: What were the beliefs, positions, interests, and concerns of the various partners with respect to adaptive co-management of Llancahue?

Context for the Decentralization of the Llancahue Watershed

Llancahue (39° 50'20" S, 73° 07' 18" W) is a 1300-ha periurban forested watershed, 7 km from the center of Valdivia, a city of 130,000 people (Figure 1). It provides the main drinking-water supply (80%) for the city and protects approximately 400 ha of old-growth, Valdivian Temperate Rainforest, an internationally recognized threatened ecosystem (Myers et al. 2000).

The Llancahue watershed and the water-treatment plant were both state owned until the late part of the 1980s (SENDOS, National Service of Public Works). During the era of Augusto Pinochet's military dictatorship (1973–1990), the government began privatization of the state-owned water-supply companies throughout Chile. By the end of the 1990s, 100% of the water-producing companies were privatized, as well as the water rights, but the protected watersheds supplying the water, like Llancahue, continued to belong to the state.

After privatization of the water plant, the only contribution of the state to protect Llancahue was to have a guard who sporadically monitored the watershed by horse 50 hours per week and did not live in or near the watershed. During this time, residents of the neighboring rural community, Lomas del Sol, began illegal timber harvesting and cattle grazing in the remnant, old-growth forests. At the time of this study (summer 2009), Lomas del Sol was comprised of 23 families. These families sold firewood and charcoal as a primary source of income. Most households did not have properties large or productive enough to meet their livelihood needs so they

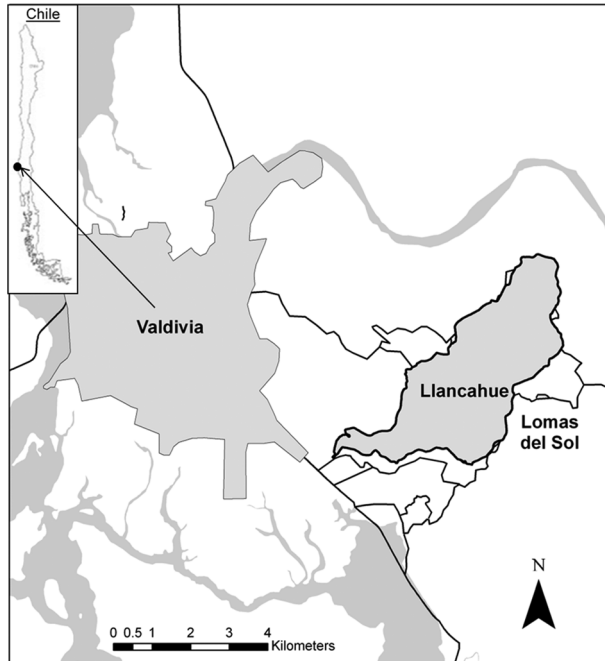


Figure 1. Location map of Llancahue.

utilized the wood, often old-growth timber, from Llancahue. Their livestock freely roamed the protected area, and the grazing reduced forest regeneration and tree survival in planted restoration projects (Moorman et al. in press).

Members of the forestry faculty at the University Austral de Chile (UACH) who conducted research in the Llancahue watershed had become concerned with the illegal activities and applied for a concession to manage Llancahue. In their application, the UACH proposed to change Llancahue from a paper park to a periurban park managed through a partnership that the UACH would coordinate. In 2008, the concession¹ was granted with the stipulation that the UACH would create a periurban park for the City of Valdivia, while (1) protecting quantity and quality of the water supply, (2) conserving biodiversity in the watershed, (3) encouraging public use through outdoor education and ecotourism, (4) conducting scientific research on ecosystem processes, and (5) managing and financing the project through sustainable forest management (Donoso et al. 2005). To accomplish these goals, the UACH proposed to create a multi-stakeholder partnership with local and regional stakeholders. Our research was conducted during the first 6 months after the concession was granted, with the objective of gaining insight on the perspectives of potential partners toward the adaptive co-management model before the official multi-stakeholder partnership began operation.

Methods

Through key informants and snowball sampling, we identified 45 potential partner organizations. Information from key informants was used to make initial contact with UACH-identified partners. We used a snowball approach to identify additional

stakeholders by asking our key informants to generate a list of potential partners during the interview process (Babbie 2007). We purposely divided potential partners into two stakeholder groups: those with resources that could assist the project (institutional, $n = 53$ representatives), and those who would be directly influenced by the project outcome (campesino, $n = 15$ households). For the purpose of this article, we refer to potential partners as stakeholders since at the time of the research the official and unofficial partners had not yet been defined. Institutional stakeholders included professors and staff at the university ($n = 18$), employees of governmental ($n = 18$) and nongovernmental ($n = 10$) organizations, and neighboring businesses ($n = 7$). *Campesino* is a Spanish word that means rural peasant. The campesino community, Lomas del Sol, was the neighboring rural community that depended on using the forest (usually illegally) and so was subject to the project outcome.

We based the stakeholder analysis on data from 68 semistructured interviews with both institutional and campesino stakeholders. This information was verified with observations made during five focus groups where we took institutional stakeholders on a tour of the Llancahue watershed, three stakeholder meetings where we discussed issues related to the coordination of the Llancahue partnership with a large group of institutional and/or campesino stakeholders, and informal interactions with stakeholders. We conducted field research from November 2008 to February 2009.

Separate semistructured interviews were developed for the campesino and institutional stakeholder groups, with some questions being asked of both groups (Moorman 2010). Interviews focused on general questions related to natural resource management in Chile, as well as specific questions related to perceptions of the use of an adaptive co-management strategy for the management of Llancahue. In addition, we asked interviewees to discuss their potential role in the partnership and to discuss perceived benefits and challenges of adaptive co-management. We interviewed stakeholders from 33 of the 45 organizations identified. This resulted in the completion of 53 institutional interviews with individuals and 15 household interviews with neighboring property owners before determining our data had reached a point where no new information was emerging. Interviews were tape-recorded (unless the participant specified he or she did not want to be recorded), transcribed in the original language of the interview, and translated from Spanish to English. All other field notes collected during the focus groups, stakeholder meetings, and informal interactions were recorded in English. Data analysis used naturalistic inquiry following the methods of Corbin and Strauss (2007) with the computer software Atlas.ti (Version 6.1.10 GmbH, Berlin 2009). This approach was an iterative process that consisted of reading and coding relevant text in each interview until key themes emerged.

For the stakeholder analysis, we followed a method developed by Sidaway (2005) and concentrated on identifying themes related to the beliefs, positions, interests, and concerns of stakeholders from the coded data. In the Results section that follows, selected quotes and descriptive statistics document themes. All quotes were cited with an alphabetical and numeric code that corresponds to a specific interview. Interviews were coded with I or C to differentiate between institutional (I) and campesino (C) informants. The numeric code links the quote to a specific interview. Following Sidaway's framework (2005), beliefs represent concepts that stakeholders held regarding how protected-area management and natural resource conservation should be, and reflect their personal or group identity. Beliefs generally remain constant through time, although the priority given to different beliefs may change

depending on circumstances. Positions represent claims, demands, or solutions and were the stances that different stakeholders took related to the creation of the multi-stakeholder partnership for Llancahue. Interests represent the desired outcomes of stakeholders for the partnership. Concerns are expressed as fears and needs that stakeholders hold toward the project and help to identify interests. These results clarified the benefits and challenges of using adaptive co-management from the perspective of the potential partners.

Results

Beliefs

A major theme that emerged from the data was that all stakeholders, including both the institutional and campesino groups, believed protected areas should be managed to provide economic, social, and environmental benefits to local and regional communities. Many of our stakeholders commented on the difference between conservation and preservation during the interview, even though the topic was not associated with prompts in the interview guide. They believed the preservationist model of strict protection could not apply in Chile and saw this as a model imposed from wealthier countries. In their interviews, stakeholders stated that protected-area management needed to “talk of management rather than preserving and closing the forest” (I32). This included adopting a “sustainable” (I29) and “multipurpose” (I2) approach, where “you work with the community” (I3). This theme was coded in 20 of the institutional interviews 33 times, 4 of the campesino interviews 12 times, and in the notes from the campesino stakeholder meeting.

Institutional stakeholders believed that the Chilean protected-area system, although impressive on paper, was really a system of “paper parks.” Stakeholders stated this was because the state did not allocate resources to protect its properties and the protected areas faced tremendous pressure from local communities that depend on them to survive. When asked whether the Chilean environmental laws adequately protected state-owned protected areas, only 8% believed they did so (Table 1, question a). All respondents who replied “maybe” clarified this response

Table 1. Stakeholder responses to close-ended questions

Question	Institutional stakeholders		
	Yes	No	Maybe
a. Do you believe the Chilean environmental laws are strong enough?	4	25	22
b. Do you think the Chilean laws lack application?	22	0	0
c. Do you believe the people of Valdivia know about Llancahue?	3	47	2
d. Should the Llancahue watershed be protected?	53*	0	0
e. Do you want to work with the UACH to manage Llancahue through a university-led multi-stakeholder partnership?	44	3	6

*Additionally, all campesino stakeholders ($n = 15$) responded yes to this question.

by stating “I mean one thing is the laws and another thing is how they are applied” (18) (Table 1, question b). Despite the protected-area status, most institutional stakeholders acknowledged that encroachment by locals into parks to poach wood and graze livestock was a serious issue in Chile.

Both the institutional and campesino groups held the belief that conservation should occur, but with benefits to local people. Even with Chile’s recent economic progress, stakeholders believed Chile lagged behind on issues of environmental policy and poverty reduction. They supported this claim by stating that few resources were allocated to conservation and a large number of people still live in poverty. Many of the stakeholders had adopted the belief that conservation and economic development needed to go hand in hand, leading to their search for a new conservation model that promoted economic development goals in the rural sector. “I believe in conservation in the broad sense of the word. That you work with the community, that you open the protected area, that you really create benefits, that you achieve your goals in an efficient manner” (13). Since local people use forests in Chile and the government does not provide resources for forest protection, stakeholders believed alternative protected-area management solutions were needed. There was a general acknowledgment that “sometimes you have to use the native forest so they can be protected” (121). Thus, the stakeholders believed regulated use of protected areas by local user groups was a preferred approach to protected-area management.

Finally, the stakeholders believed the local and regional community did not know about or value the Llancahue watershed as either a water-supply watershed or old-growth forest close to the city. Stakeholders talked about the need to create environmental awareness among the Valdivian and Chilean people. This was reflected in the fact that 89% of institutional stakeholders believed the Valdivian people did not know that their water came from Llancahue (Table 1, question c). In general, stakeholders commented that they did not believe people would protect resources they did not know and value.

Positions

At the beginning of the concession, all stakeholders agreed that the current management of Llancahue was ineffective, but stakeholders’ positions regarding how the Llancahue property should be managed differed. Seventy-seven percent of the institutional stakeholders took the position that Llancahue should be turned into a periurban park for the City of Valdivia following the plan outlined by the UACH. They felt the UACH’s plan would help to protect Llancahue’s old-growth forest and water supply. Most of the resistance toward the UACH’s plan for the periurban park was from UACH employees. The UACH employees were split on the advisability of accepting the concession at the time of the transfer. Half of the employees were in support of the project ($n=7$) and believed the project would be an opportunity to apply university science to the reserve’s management and create an important resource for the city. The other half of the employees interviewed ($n=7$) took the position that the management of Llancahue should not be the job of the university. They feared that the university lacked the resources and staff for the project. This subgroup perceived the idea of the Llancahue periurban park as risky because of the uncertainty surrounding it and the responsibility that the acquisition put on the UACH financial and personnel resources. One employee of the university was completely opposed to the idea. He believed the university should not get involved

with the project because it was too risky due to the fact that the watershed was the city's water supply. He felt Llancahue should "not be touched under any circumstances."

Interests

Despite these varying positions, all stakeholders believe the Llancahue watershed should be better protected (Table 1, question d). For all institutional and campesino stakeholders, the protection of water and forest resources were their top interests (Figure 2). Respondents felt the goals of environmental education and ecotourism and of sustainable forest management were important because they could help demonstrate the social and economic values of conservation. The UACH's plan for the watershed included creating value-added products such as sustainably managed timber from the 800 ha of second-growth forests to promote water production, creating a platform for ecotourism in the 400 ha of old-growth forest, and developing environmental education programs. The UACH believed that these products would help improve forest management, create new entrepreneurship, and promote environmental ethics and support among citizens, respectively.

Stakeholders shared an interest in finding a way to stop illegal logging in protected areas. They were interested in determining whether revenue-generating activities for local communities in the protected area could reduce or eliminate illegal logging pressures. Stakeholders saw an immense need for this in Chile because protected areas faced tremendous strain from local people and there were few mechanisms currently available for reducing these pressures. Even people who were less certain about conducting sustainable forest management in a protected area conceded that it might be the only option for working with the local people: "Llancahue is a jewel, a diamond and we should not cut there, but if it is not possible to change the people from cutting the forest then it is better to make a forest management plan than nothing" (I52). The majority of the campesinos ($n = 14$ of 15 households) saw the benefits of sustainable forest management since it would provide jobs and wood for charcoal production to the community.

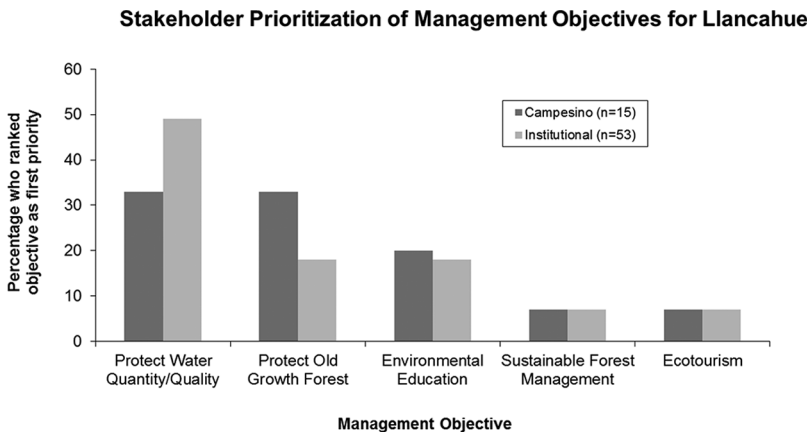


Figure 2. Ranking of stakeholder interests for UACH management goals in order of importance for the Llancahue project.

Finally, one of the key institutional interests for this project was to demonstrate how a multi-stakeholder partnership could improve protected-area management by improving the flow of resources to the watershed. Stakeholders were searching for an alternative to the traditional preservationist model of protected-area management in Chile that relied on a state-run system of protected areas with top-down, restrictive approaches to governance. They spoke of the appeal of the adaptive co-management model and were willing to work with the UACH through the multi-stakeholder partnership to protect Llancahue (Table 1, question e), but still lacked concrete examples of how this model could be specifically implemented in Chile.

Concerns

Stakeholders were concerned inadequate planning would result in a multi-stakeholder partnership destined for failure. Despite the rhetoric from institutional stakeholders on the need for a new model for protected-area management in Llancahue, stakeholders acknowledged that designing a multi-stakeholder partnership was still in the experimental stages. Stakeholders suggested that for an effective multi-stakeholder partnership to be created, stakeholders needed well-defined, organized plans so concrete roles could be assigned. As one stakeholder stated, "More than anything we lack organized information that is well articulated" (I41). Both institutional and campesino stakeholders were most concerned about the ambiguity surrounding the Llancahue project. A recurring theme in the interviews and stakeholder meetings was the need for concrete plans. In fact, the point was made at the large stakeholder meeting held in January 2009 that the current plan for Llancahue was idealistic and unachievable in its current state. All institutional stakeholders agreed that the overall goals of the UACH needed to be broken down into more manageable parts and actions.

Risk responsibility was a major concern discussed in stakeholder interviews. Stakeholders were unsure who would be assuming the financial, personnel, and legal risks. It was assumed that personnel costs would increase for university staff as well as other members of the multi-stakeholder partnership. Stakeholders were not clear who would be responsible for natural or anthropogenic disasters that could occur in the watershed, but acknowledged that protection of the water supply was a serious concern.

Stakeholders, especially UACH employees, were concerned about the lack of a clear vision of how the UACH would find the resources to manage and administer the park. One employee suggested this was always the greatest fear related to the Llancahue concession. "When we were talking about transferring Llancahue from the state to the university, in that meeting, most of the concerns were related to raising money there" (I3). In all the interviews, people were uncertain how the project would be financed, but most suggested forest management, government grants, and research grants as the most important financing mechanisms. Most stakeholders held the position that the project's success hinged on its ability to receive financial support.

Stakeholders recognized that the co-management model would require the collaboration of multiple stakeholder groups, yet stakeholders directly referenced the difficulty of achieving effective collaboration in Chile. "The bad thing we have here, I have seen it many times before in other organizations, high levels of distrust, little teamwork and little associations" (I7). Stakeholders expressed concerns that in many

conservation projects in Chile, stakeholders were excluded, or not included until after the project was underway. This isolated stakeholders from the project and caused conflict among stakeholder groups. Stakeholders felt that having a clear communication and outreach plan could help reduce this fear. They suggested that once plans were more concrete, then:

[The] UACH must do outreach, a more clear and defined outreach, asking collaboration from community, institutions and public agencies so they have a real link with this park. I think Universidad Austral could do this and I think many agencies . . . would be favorably disposed to collaborate. (I31)

Stakeholders believed that project success would depend on the ability of the UACH to communicate with their partners and suggested the UACH develop a communication plan.

Degradation of the old-growth forest and water supply by the campesinos was the greatest concern for all stakeholders. This potential crisis was the antecedent condition that spurred the UACH to push for the concession: It feared the forest would be destroyed if no intervention occurred.

My main concern is that I saw these old growth forests were being harvested and it was a process that would end at some point with total destruction of this magnificent old growth forest half an hour away from Valdivia. (I8)

This is also why the Ministry of National Assets gave the concession to the university.

That's why we are doing this, because if the property would still be in our hands, without giving to anyone the administration, in 10 years there would be no more forest. (I48)

A clear theme emerged from stakeholders that even though the project was risky, it was necessary if they wanted to protect the old-growth forest and water supply for future generations.

Discussion

Llancahue serves as a case study that can further our understanding of the potential for implementing decentralized conservation management strategies to improve the conservation of currently unfunded, protected areas in Chile. Stakeholder beliefs, positions, interests, and concerns (summarized in Table 2) highlight the perceived benefits and difficulties of implementing a multi-stakeholder partnership as an adaptive co-management strategy. Partners were in agreement that the project could improve management of Llancahue, a need identified by all, but they were still uncertain how the project would be implemented. The uncertainty expressed by the potential partners reinforces much of the ambiguity persisting in the literature with respect to decentralized conservation (Linder 1999; Kellert et al. 2000). Although adaptive co-management schemes such as multi-stakeholder partnerships

Table 2. Summary of stakeholder beliefs, positions, interests, and concerns*General themes from the stakeholder analysis***BELIEFS**

Protected area should be managed to provide economic, social, and environmental benefits for local and regional communities—*all stakeholders*

The current Chilean protected area system was a system of “Paper parks”—*all stakeholders*

Valdivian residents do not currently know or value the Llancahue watershed—*all stakeholders*

POSITIONS

Majority opinion—Llancahue should be conserved and managed following the plan outlined by the University—*University employees for the partnership and other potential partners*

Minority opinion—Llancahue should be conserved and managed, but not with University resources—*University employees opposed to the University led partnership*

Minority opinion—Llancahue should be left untouched—*University employee opposed to the University led partnership*

INTERESTS

Reduce pressure of illegal logging—*institutional stakeholders*

Allow activities within Llancahue that demonstrate economic and social benefits of conservation while protecting forest and water resources

Demonstrate that a university-led, multi-stakeholder partnership can improve conservation of Llancahue

CONCERNS

Ambiguity surrounding project plans and unclear institutional design

Risk responsibility

Poor communication

Financing

have been proposed as an ideal conservation solution, potential partners needed a better understanding of how the Llancahue multi-stakeholder partnership would function within the context of the Chilean institutional and organizational landscape before fully committing to the process (Plummer and Hashimoto 2011). Stakeholder concerns focused on the themes of role/risk responsibility, fiduciary obligations, and ambiguity over the new collaborative governance structure.

Stakeholders felt the best way to address these concerns was to be as explicit as possible about the potential roles and responsibilities that stakeholders were assuming as part of the multi-stakeholder partnership and how these roles would be managed. This suggests that the university still needed to address the problem of policy coordination by defining the organizational terms of the partnership. This finding supports previous research on adaptive co-management that has suggested weak organizational structure can cause collaborative processes to break down (Grumbine 1997; Varvasovsky and Brugha 2000; Selin and Chavez 2005). Determining exactly how multiple partners can work together to address conservation management issues is a complex task that needs to be addressed through appropriate

planning (Daniels and Walker 2001; Domenici and Littlejohn 2006). For example, the Girringun Aboriginal Corporation in north tropical Queensland, Australia, represents a long-term conservation partnership that has had success in addressing the issue of role responsibility by building a strategy it calls the “pillars of comanagement.” This is a cyclical process that includes learning-by-doing, the building of rapport and respect, sorting out responsibilities, practical engagement, and capacity building (Zurba et al. 2012). A first step in accomplishing this for Llancahue was the signing of a Memorandum of Understanding between nine organizations that would be represented on Llancahue Steering Committee.

One advantage of the Llancahue partnership is that the UACH is well connected in the Valdivian conservation community. Active participation by potential partners in both the stakeholder interviews and the stakeholder meetings is evidence of this rapport (Maskey et al. 2006). As part of the planning process, the UACH will need to address the concern of risk responsibility. This step would be addressed by the steering committee that has been formed and includes nine institutions, including one nongovernmental organization (NGO), the municipality, three public services, the neighboring rural community of Lomas del Sol, and the regional government, in addition to UACH and the Ministry of Lands. By clearly establishing guidelines, the steering committee will help partners sort out risks by allowing them to weigh the social and environmental benefits of participation against financial, personnel, and legal costs (Wettenhall 2003). Most stakeholders interviewed took the position that the risk of doing nothing and losing the old-growth forest outweighed the risks of participating in co-management, but the co-management needed to explicitly address how partners would be protected against risk (e.g., explicitly addressing budgets, partner duties, and legal responsibilities of individual agencies). Hayes and Persha (2010) showed that the use of independent third-party governance agencies such as the UACH has improved local forest governance in Mesoamerica and East Africa, but that careful thought regarding rule-making and institutional design was a key aspect of the process.

Finally, one of the greatest challenges described by the stakeholders was determining appropriate financing structures for the decentralized management of Llancahue. Thus, an important output of the Llancahue project will be to demonstrate how local conservation initiatives in Chile can be financially sustainable. Much of the current management is funded from in-kind salary donations from the UACH and research grants. Since the establishment of the concession, the UACH has received three research grants for conducting applied research in Llancahue, but this money depends on granting agencies. Additionally, funding obtained from the legal sale of firewood from the Llancahue property allows the UACH to provide a steady, yearly source of income to the Lomas del Sol community. A local NGO partner received a small grant that has allowed them to provide agricultural training to the Lomas del Sol community and helped women in the community construct greenhouses and compost piles. One thing is clear: Funding for projects in Llancahue project will come from many source and many partners and be dependent on the project being implemented.

Conclusion

During the past 20 years, there has been much discussion of a need for a more decentralized approach to protected-area management that incorporates local and regional partners in the management of protected areas (McNeely 1994; Phillips

2003; Joppa et al. 2008; Elbers 2008). Chile is one example of a country that is beginning to implement decentralized conservation for the management of its protected areas by transferring power to third-party agencies such as the UACH. One of the major drivers behind this initiative in Chile is that the government is not investing in the management of its protected-area network, so local and regional actors are lobbying the government for concessions to the property. Despite the challenges involved in managing a protected area, these local actors see no other choice for protecting their local water supply and old-growth forest.

There is currently a need to better understand the implementation of adaptive co-management strategies in various cultural contexts (Plummer and Hashimoto 2011). Llancahue illustrates an important case study for understanding how decentralized management can be implemented through local, third-party intermediaries in Chile. Our research during the initial phase of implementation suggests that the organization of multiple agencies to manage a protected area will be challenging, but is possible due to the network of local and regional stakeholders interested in the project. Addressing challenges up front through effective communication and an explicit partnership design will help build capacity among partners with respect to this new form of governance for Llancahue. Should the UACH fail in its aims or decide it no longer wished to continue, the Ministry of Lands would likely pursue an alternate concessionaire with similar capacity—perhaps an NGO or another university. There is no guarantee that the co-management approach would continue to be pursued under that scenario (P. Donoso, personal communication, June 21, 2012). There is much to learn from the implementation of the Llancahue multi-stakeholder partnership model that can be applied to many of the other small forested, water-supply watersheds in Chile, and perhaps elsewhere.

Note

1. A copy of the agreement (in Spanish) is available from the author.

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