Environmental Management (2017) 60:908–921
DOI 10.1007/s00267-017-0913-5

Comparison of USDA Forest Service and Stakeholder Motivations and Experiences in Collaborative Federal Forest Governance in the Western United States

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Received: 17 July 2016 / Accepted: 9 July 2017 / Published online: 16 August 2017

Abstract In the United States, over 191 million acres of land is managed by the United States Department of Agriculture Forest Service, a federal government agency. In several western U.S. states, organized collaborative groups have become a de facto governance approach to providing sustained input on management decisions on much public land. This is most extensive in Oregon, where at least 25 "forest collaboratives" currently exist. This affords excellent opportunities for studies of many common themes in collaborative governance, including trust, shared values, and perceptions of success. We undertook a statewide survey of participants in Oregon forest collaboratives to examine differences in motivations, perceptions of success, and satisfaction among Forest Service participants ("agency participants"), who made up 31% of the sample, and other respondents ("non-agency") who represent nonfederal agencies, interest groups, citizens, and non-governmental groups. We found that agency participants differed from non-agency participants. They typically had higher annual incomes, and were primarily motivated to participate to build trust. However, a majority of all respondents were similar in not indicating any other social or economic motivations as their primary reason for collaborating. A majority also reported satisfaction with their collaborative—despite not ranking collaborative performance on a number of specific potential outcomes highly. Together, this suggests that collaboration in Oregon is currently perceived as successful despite not achieving many specific outcomes. Yet there were significant differences in socioeconomic status and motivation that could affect the ability of agency and nonagency participants to develop and achieve mutually-desired goals.

Keywords Collaboration · forest management · United States · national forests

Introduction

Collaborative natural resource management and stakeholder engagement has been long-recognized as a growing trend in environmental governance worldwide. State lands formerly managed exclusively by government agencies are often now governed by institutions that reflect a range of approaches from open public participation to decentralization and devolution of state roles and even land tenure to other actors in and outside government. Despite these new approaches, the state retains a prominent position in many collaborative governance settings. Even when lands are transferred to other ownerships, "the shadow of the state" may continue to influence and shape resource management (Parkins 2008). More often, the state remains the landowner and official decision making authority, with varying degrees of power-sharing and participation among public and community entities. As such, there are many questions about the enduring roles of the state in natural resource management,

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and how governments and stakeholders interact in collaborative governance arrangements (Koontz 2004).

In the United States, over 191 million acres of federal land is managed as state or "public land" by the United States Department of Agriculture (USDA) Forest Service, a federal government agency. This state land has largely remained under federal decision-making and primarily bureaucratic control; only more recently have approaches such as community forestry, co-management, common property institutions, or other transitions in land tenure practices been considered (e.g., Agrawal 2001; Carlsson and Berkes 2005). However, the Forest Service has increasingly incorporated public participation in its management as a result of changing requirements and guidelines for public input, as well as legal means for the public to challenge and change agency decisions through the National Environmental Policy Act (NEPA), the Administrative Procedures Act, and Council of Environmental Quality. The scope of public input has continued to grow over the past several decades, coming to include not only bilateral avenues of interaction (between a single stakeholder and the agency); but also multi-lateral venues, wherein multiple stakeholders interact with each other to find common ground and shared collective input to the Forest Service—often called collaboration. Importantly, this has taken place through the environmental analysis process required by NEPA, as well as a variety of other initiatives, such as stewardship contracting, community wildfire protection planning, and Collaborative Forest Landscape Restoration Program projects, which invite varying degrees of stakeholder and citizen engagement.

Collaboration is freighted with great expectations. According to the Forest Service Chief Tom Tidwell, such efforts are intended to help forest management move "toward a shared vision that allows environmentalists, forest industry, local communities, and other stakeholders to work collaboratively toward healthier forests and watersheds, safer communities, and more vibrant local economies" (Tidwell 2012). Forest Service leaders and stakeholders expect that collaboration will build support for agency decisions, expand trust between decision-making authorities and the public, reduce costs and delays associated with litigation, and accelerate the implementation of land management activities (Goldstein and Butler 2010). This collaboration is increasingly occurring through collaborative bodies with "the ability to organize and sustain [themselves] as a group" (Cheng and Sturtevant 2012) that endure beyond a single process. In the US West, there are now numerous such collaborative groups ("collaboratives") with defined missions, policies and procedures, and regional credibility that meet regularly and focus on multiple projects and/or on the overall direction of specific area of public lands.

Since the land that these collaboratives focus on is federally-managed, Forest Service and other federal and state agency representatives participate in a variety of ways, including instigating new processes, providing technical information, and attending meetings. Typically, these are agency personnel in the National Forest System, working on national forest units. Previous studies suggest that active participation of Forest Service staff in collaborative groups can factor positively into success at achieving desired outcomes (e.g., Butler 2013; Wondolleck and Yaffee 2003). Yet, some conservation groups and collaboration skeptics suggest that the Forest Service might value collaboratives primarily as "rubber-stampers" that provide social license to the agency's plans rather than as venues for deliberative process that genuinely affects decision outcomes (Hibbard and Madsen 2003). However, very little research has documented what motivates these federal agency participants to participate in collaboratives, what outcomes they hope to achieve, and how their experiences may vary from other collaborative participants. Moreover, what are the implications for collaborative governance of public lands wherein the state retains land tenure and decision making authority? Research on collaboration has been largely case study-focused, and relied on interview data (e.g., Cheng et al. 2015; but see Schuett et al. 2001). This captures the agency participants in a local context, but does not provide broader insights about agency participation in collaboration possible from a larger study population.

Our research team undertook a statewide survey of participants in Oregon forest collaboratives to ask: how do motivations for collaborating, perceptions of efficacy and success, and satisfaction with outcomes differ between agency and non-agency participants? Respondents identified their professional or other affiliations and demographic characteristics. Oregon was chosen for study because of the extent of federally-owned land (over 50%), and the development of organized collaboratives working on these lands has been significant; at least 25 currently exist, the most of any US state. Further, these groups are found across a diversity of forest ecosystems and national forest units. Finally, there has been an unusual level of interest and investment in forest collaborative groups from the state of Oregon, Region six of the Forest Service, and nonprofit organizations, all of whom have provided grants and technical assistance. The breadth and depth of this phenomenon in Oregon affords excellent opportunities to (1) study the motivations and goals of agency participants in organized collaborative groups and (2) move beyond case study approaches to offer conclusions from a larger population of collaborative participants across diverse forest contexts.

This paper presents where motivations, perceptions of success, and satisfaction among USDA Forest Service participants ("agency participants") in Oregon

collaboratives, who made up 31% of the sample, differ from those of collaborative stakeholders. We present study results and implications for broader knowledge about collaborative governance in settings wherein the state remains an active manager and landowner.

Study Context: Federal Land Management and Collaboration in Oregon

In Oregon, federal agencies manage 60% of all forested land in the state. The largest federal land managers are the US Forest Service and the Bureau of Land Management. The Forest Service manages approximately 15,696,492 acres on 11 National Forest System units, which span a variety of ecoregions from the Coast Range to Northern Basin and Range. Each ecoregion has its own suite of resource issues, challenges, and stakeholders.

Approximately 25 forest collaborative groups currently operate in the state of Oregon. The first began in 1992 (Fig. 1, Table 1), and more than half have emerged only since 2011. The motivations for collaborative formation are context-specific, but larger policy trends also contributed. Generally speaking, groups forming in the 1990s were driven by the decrease of harvest on federal lands following the Northwest Forest Plan, and the Endangered Species Act listing or potential listing of species such as northern spotted owl and Chinook salmon. These regulatory changes prompted shifts in the social and economic fabric of rural communities that had depended on federal timber harvest, and exacerbated tensions and distrust toward federal agencies. In the 2000s, new fire policies and funds for collaboration around wildfire risk reduction (e.g., Healthy Forests Restoration Act, Collaborative Forest Landscape Restoration Program) likely helped spur group formation and evolution. After 2011, stories of success from the early groups (e.g., Brown 2012), as well as financial, political, and technical support from state, federal, and non-profit institutions created fertile ground for the growth of more collaboratives across Oregon.

The focus and activities of collaboratives vary, but they typically "provide review and recommendations for federal forest management activities occurring near their communities" that intend to combine ecological sustainability, economic viability, and social acceptability (Oregon Solutions 2013, p. 2). For nearly all these Oregon forest collaborative groups, the federal manager in question is the Forest Service. Infrequently, U.S. Fish and Wildlife or

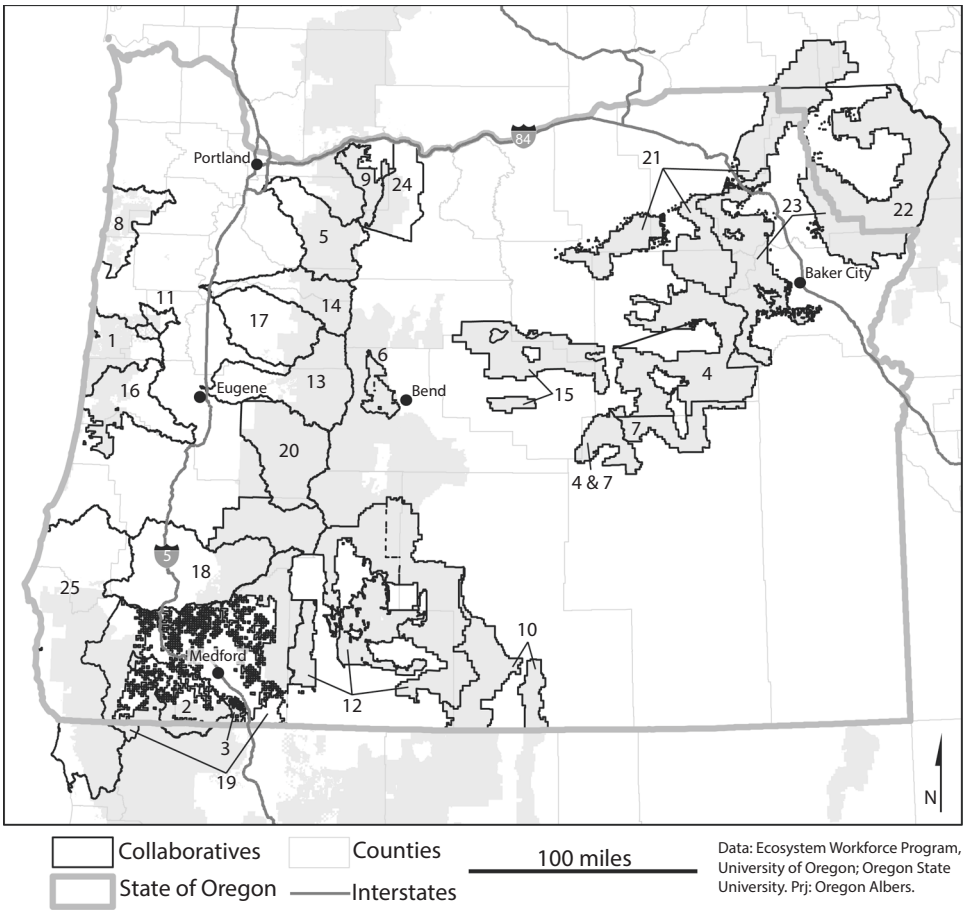

Fig. 1 Oregon's federal land forest collaborative groups

Table 1 Collaborative groups in Oregon by map location and year formed

Map number	Group	Year formed
1	Alsea Stewardship Group	2006
2	Applegate Partnership & Watershed Council	1992
3	Ashland Forest Resiliency Project	2010
4	Blue Mountains Forest Partners	2006
5	Clackamas Stewardship Partners	2004
6	Deschutes Collaborative Forest Project	2009
7	Harney County Restoration Collaborative	2008
8	Hebo Stewardship Group	2011
9	Hood River Collaborative Stewardship Crew	2005
10	Lakeview Stewardship Group	1998
11	Marys Peak Stewardship Group	2007
12	Master Stewardship Agreement on the Fremont-Winema National Forest	2010
13	McKenzie Watershed Stewardship Group	2013
14	North Santiam Forest Collaborative	2012
15	Ochoco Forest Restoration Collaborative	2011
16	Siuslaw Stewardship Group	2001
17	South Santiam All-Lands Collaborative	2012
18	South Umpqua Rural Community Partnership	2004
19	Southern Oregon Forest Restoration Collaborative	2005
20	South Willamette Forest Collaborative	2014
21	Umatilla Forest Collaborative Group	2011
22	Wallowa County Natural Resources Advisory Committee	1996
23	Wallowa-Whitman National Forest Collaborative	2012
24	Wasco County Forest Collaborative Group	2015
25	Wild Rivers Coast Forest Collaborative	2012

Bureau of Land Management staff may also participate in a few collaborative groups but this is very limited. References to "the agency" throughout this paper thus refer to the Forest Service. References to "public lands" or "federal lands" managed by federal agencies should be seen as analogous to the term "state lands" as it is used internationally to refer to government-owned or managed land; the term "state lands" is not used here due to the potential for confusion with lands owned by US state-level governments. Collaborative input can occur before or during the environmental planning process, through stewardship contracting, and/or through monitoring. Some groups work in detail with the Forest Service to build agreement amongst their participants about future activities in a particular area, while others provide broader-scale input about their interests.

Given the extent and importance of federal land in Oregon, the state also formed a Federal Forestland Advisory Committee (FFAC) tasked with developing an ecologically, economically and socially sustainable vision for federal forests. The FFAC developed a recommendations report in 2009, which placed collaboratives as integral to the vision by stating that "The Governor and the State Legislature should assist federal agencies in providing administrative, financial, and technical resources to local collaborative partnerships to build trust and help identify scientifically informed and socially acceptable forest management", and that "collaboration among diverse interests…must become the norm" (Oregon Board of Forestry 2009, 31–32). Following these recommendations, the legislature supported a state Federal Forest Health Program, first from 2013–2015 and then again from 2015–2017. This state program dedicates resources to the capacity of forest collaboratives and the Forest Service to implement more federal forest restoration activities. It comes with expectations from state and federal managers that collaborative groups can build social agreement to increase the pace and scale of restoration, with outcomes for watershed health, wildfire resilience, and economic activity.

In short, collaborative natural resource management practiced through organized collaborative groups has become a commonly used model in Oregon, and many federal land managers are conducting at least some of their work with a collaborative approach. Moreover, the expectations of collaboratives to produce "triple bottom line"—ecological, social, and economic—outcomes are particularly high and have garnered state investment in collaboration.

Literature Review

Collaboration and the USDA Forest Service

Collaborative governance in natural resource management has been heralded as an opportunity to engage diverse stakeholders in deliberation over critical natural resource issues, resulting in positive ecological outcomes and social benefits (Wondolleck and Yaffee 2000). A popular definition of collaborative governance is "a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (Ansell and Gash 2008, p. 544). We employ this definition here as it fits well with the nature of much public lands collaboration in the United States. While national forest managers in the USDA Forest Service and other federal government managers retain the control and management of public lands, they are increasingly attempting to create space for more input from stakeholders; notably, however, this input may not always be focused on 100% consensus decisions. The Forest Service collaborates in a range of venues, from public information meetings, to workshops to gather input, to enduring collaborative groups that may lay out project details and specifications, establish "zones of agreement", and provide detailed feedback on proposed actions (Butler 2013; Fernandez–Gimenez et al. 2008). However, as other research has suggested, "the Forest Service has an uneasy relationship with collaboration" (Butler 2013, 396), and across national forests, there is likely variability in what collaboration means to agency staff and how they practice it. This uneasiness may stem from uncertainty or discomfort around allowing external parties a role in government decision making that only the agency is authorized to undertake (Butler 2013). Moreover, there are no specific regulations, rules, or guidelines for how to collaborate, and how to utilize collaborative input in agency decision making processes.

Several studies have closely examined how government agencies can best work with collaborative stakeholders, and what roles they are taking. Individuals can have a variety of roles within a forest collaborative. Some individuals may participate in forest collaborative groups by attending meetings and providing input but may not consider themselves (or be recognized as) a "member" of the collaborative. Further, many collaboratives use a voting process to make decisions. Voting membership can be contingent on frequency of meeting attendance, or by signature of some kind of commitment document (Butler 2013). A collaborative participant who attends meetings regularly, and who may contribute significant information or otherwise exert influence, may still choose to remain a non-member. Voting rights are not confined to only those who live in the area covered by the collaborative.

These studies suggest that in general, agencies need to be deeply engaged for collaboration to be successful (e.g., Yaffee and Wondolleck 1997). Research has found that agency leadership in initiating processes is important, and that agencies are somewhat successful at fulfilling this role. Agency investment of time, and other demonstrations of commitment, can also contribute to increased legitimacy for the collaborative effort. But for the agency to fulfill other roles may prove more challenging (Wondolleck and Ryan 1999). For example, more active partner roles require participants to invest in the "we" of the group, which can be difficult for agency staff whose identities and work are deeply tied to the Forest Service. Research suggests that serving as facilitator is also not an ideal role for an agency, as attempting to be neutral or lead processes can be incompatible with the ability of the agency to share its interests openly; or could lead to undue influence. A study of Collaborative Forest Landscape Restoration Program projects suggests that some agency participants are taking an "arms-length" approach to collaborating (e.g., not serving as a voting member, not participating in decisions), due to fear of violations of the Federal Advisory Committee Act (FACA). This creates tensions for agency participants and limits their ability to constructively share their interests (Butler 2013). This study concluded that agencies should not in fact serve as leaders or voting members, but that by being consistently involved, contributing interests and information to the dialog, and helping design collaborative approaches with FACA in mind, they can contribute most effectively to collaborative success. Importantly, although agency participants such as line officers are the decision-makers on their lands, they are not typically decision makers in the collaborative group process itself.

In addition to studying agency roles, there has been a fairly long tradition of examining public lands collaboration more generally. This has focused on themes including participant satisfaction with outcomes and factors in success, as well as how to define success. Previous studies of satisfaction have found it to be generally high (e.g., McKinney and Field 2008; Selin et al. 2000), yet defining success and identifying factors that lead to it has remained more elusive (e.g., Conley and Moote 2003; Schuett et al. 2001). There has also been an enduring focus on the role of trust. Trust is a key predictor in the social acceptability of forest actions (Vaske et al. 2007), and the desire to improve trust may stimulate agency participation in collaborative processes. A high degree of trust also has been identified as an important element in the effectiveness and performance of collaborative groups (Dirks 1999; Margerum 2011). Most recently, Stern and Coleman (2015) identified four types of trust: dispositional (predisposition of individuals to

trust), rational (based on likeliness of predicted behavior as judged by prior performance), affinitive (based on shared values and developed through positive interactions), and systems-based (transparent process, fair and just procedures). They posit that the diversity of these four trust types is important for successful outcomes, and that when one type of trust is damaged, having other types of trust can buffer the loss (Stern and Baird 2015).

Despite the depth with which trust has been explored recently, there remains little concrete understanding of how enhanced trust within a collaborative contributes to substantive ecological or socioeconomic outcomes; and its importance relative to other potential factors in success. Moreover, there have been no cross-case efforts to understand whether trust is a motivating factor for collaborative participation, a means to an end, or an end unto itself—and for whom, which is important to examine given claims that the Forest Service values collaboration primarily for social license (e.g., Coulter et al. 2015). There is also a need to examine potential links between satisfaction with trust and perceptions of success.

Methods

We created a survey of 24 questions using important themes from the existing literature on forest collaboration and collaborative governance as well as the authors' previous participant observation in several different collaborative groups across the state and in adjacent states. The survey was approved by the lead author's Institutional Review Board [institutional name withheld for blind review] (protocol #6792). The survey was administered solely on the Internet using Qualtrics, a standard online survey program for which Oregon State University has a license. Collaborative group members regularly use the Internet and email for formal and informal communication amongst collaborative members. The use of an Internet-only survey was not expected to hinder the capacity of collaborative members to participate. The survey was piloted with five collaborative stakeholders representing diverse perspectives and geographical locations in Oregon.

We designed our survey to examine several aspects of agency participation in collaboration that have previously been explored in research, as well as those relevant to current collaborative management in Oregon (Table 1). Survey questions were focused on three broad themes: motivations for participating, importance and performance of various outcomes of the collaborative, and satisfaction with the collaborative's effectiveness. Querying these dimensions together allows for a more nuanced understanding of perceptions of success. Additional survey questions focused on tenure and frequency of participation in collaborative meetings, roles in the collaborative, attitudes towards the environment, and demographic characteristics.

Invitations to the survey were sent to the coordinators/facilitators of each of the 25 recognized forest collaborative groups in Oregon, with a request that they send it to their participant email distribution lists. We followed up with repeat invitations until we ensured that the survey had reached all of these groups. Respondents were asked a series of filtering questions to determine if they did participate in a forest collaborative and to identify the single collaborative group with which they were most active currently. The respondent was instructed to respond to the survey with that group in mind. Because Oregon's collaboratives vary in size, we attempted to ensure that we had responses from each group that were proportional to their group size by conducting targeted follow-up. However, our primary goal was to obtain a large sample of the population of individuals participating in collaboratives, regardless of collaborative. Survey data were collected between May and June 2015. Because invitations to participate in this survey were sent to all known collaborative participants included in each collaborative's email list, there was no stratification for agency or non-agency individuals. Future research efforts could build on this approach with a stratified random sample of agency and non-agency collaborative participants.

Survey data were cleaned using IBM SPSS (Statistical Package for the Social Sciences) Statistics 22, a statistical analysis software program commonly used for survey data. Data were checked for internal consistency and missing responses were filled if the answer was obvious based on responses to other questions. For example, if a respondent failed to answer "yes" that he or she participated in collaboratives in Oregon, but did provide the name(s) of collaboratives he or she was a participant in when responding to a later question, the answer of "yes" was put in the missing response.

We completed statistical comparisons between agency and non-agency collaborative participants (Table 2) using SPSS and SAS (Statistical Analysis System). The survey data were exclusively categorical in nature. Alpha = 0.10 was used as the a priori threshold for statistical significance, although ultimately most statistically significant comparisons had p-values of less than 0.05. We tested the effect of using a finite population correction in SAS to improve the efficiency of the contingency table analyzes and found no difference in the interpretation of the results. We did apply the finite population regression in SAS when using logistic regression for the ordinal responses on satisfaction.

Results

We received 260 responses, 215 of which were viable cases for analysis. Cases were removed from consideration if the

Table 2 Aspects of forest collaboration compared between agency and non-agency participants

Theme	Variable	Statistical test
Participation and demographics	Years collaborating	Wilcoxon-rank sum test
	Frequency of attendance	
	Gender	Contingency table
	Age	
	Household income	
Motivations	11 motives for participation	Mann–Whitney U
		Contingency table
Roles	Non-member	Contingency table
	Voting member	
	Subcommittee member	
	Technical support	
	Science support	
Importance and performance	15 outcomes of collaboration	Contingency table
Satisfaction	Overall satisfaction	Logistic regression
	25 aspects of collaboration	

respondent did not belong in the population (e.g., the respondent did not participate in a recognized forest collaborative), did not complete a significant portion of the survey, or did not consent to the survey. We estimate that there are approximately 400 unique individuals in Oregon's 25 collaboratives. Response rate to the survey was, therefore, about 54 (0.54 was used as our finite population correction factor for statistical testing).

Of the 215 usable cases, 66 respondents (31%) identified they participated in collaboratives as agency employees. Agency staff who participate in collaboratives are almost entirely from the National Forest System branch of the Forest Service and work on National Forest System units in Oregon, where they interact with collaboratives as part of their jobs. Agency and non-agency respondents were well distributed among the 25 forest collaborative groups currently operating in Oregon.

Demographics

Seventy-five percent of survey respondents were male. Non-agency respondents were more frequently male (79% of respondents) than their agency counterparts (67%) ($\chi^2 = 2.886$, p-value $= 0.089$). The majority (63%) of collaborative respondents, regardless of agency affiliation, were over the age of 50 (Fig. 2a). However, the age distribution differs between the two respondent groups ($\chi^2 = 16.051$, p-value < 0.01). A much larger share of non-agency collaborative participants were 65 years of age or older compared to agency participants. While agency staff are more likely than non-agency staff to be younger, the majority of all respondents regardless were over 50 years. The majority of collaborative participants in both respondent categories had household incomes of between $50,000 and $130,000 per year (Fig. 2b). But patterns of household income differed ($\chi^2 = 23.384$, p-value < 0.01): agency participants were much more likely to have household incomes between $80,000 and $130,000, and non-agency participants were more likely to have household incomes of less than $50,000.

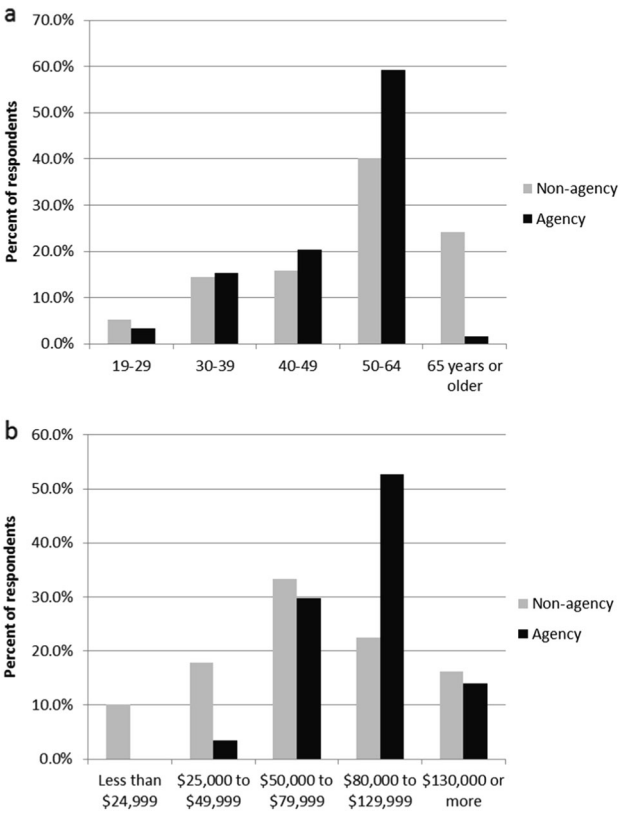

Fig. 2 Agency and non-agency forest collaborative participants differ in patterns of age **a** ($\chi^2 = 16.051$, p-value < 0.01) and household income **b** ($\chi^2 = 23.384$, p-value < 0.01)

Table 3 Stated motivating factors and single primary motivation for agency and non-agency collaborative participants

Motivation	A motivating factor		Primary motivation[a]	
	Agency	Non-agency	Agency	Non-agency
To improve relationships and trust among stakeholders	77.3%[b]	55.7%[b]	45.5%	14.5%
To restore forest resiliency	54.5%	57.0%	19.7%	20.0%
To protect fish and wildlife habitat	31.8%[b]	49.4%[b]	10.6%	15.9%
To get more timber supply off public lands	27.3%	30.4%	4.5%	11.0%
To reduce wildfire risk to communities	45.5%	37.3%	4.5%	2.1%
To have more say in public land management decisions	16.7%[b]	50.6%[b]	3.0%	9.0%
To create more local jobs	37.9%	48.7%	1.5%	6.2%
To improve recreational opportunities	13.6%[b]	28.5%[b]	1.5%	2.8%
To protect water resources	34.8%	43.7%	1.5%	5.5%
To maintain public access to public lands	10.6%[b]	24.1%[b]	0.0%	2.8%
To protect cultural resources	13.6%[b]	24.1%[b]	0.0%	2.1%
Other	18.9%	15.2%	1.5%	6.2%
Job requirement[c]	n/a	n/a	6.1%	2.1%
Total	n/a	n/a	100.0%	100.0%

[a] The pattern of responses for the primary motivation of agency and non-agency respondents is statistically different: χ^2 value = 38.507, P-value < 0.00

[b] χ^2 statistical tests on the patterns of yes/no responses for agency and non-agency respondents resulted in a p-value of less than 0.10 for this motivation

[c] 'Job requirement' was written often enough in open-ended responses as an "other" primary motivation for collaborating that we identify it separately

Duration of Participation in Collaboration

There was no statistically significant difference (z score = −0.414, p-value = 0.679) between agency and non-agency respondents in duration of participation in forest collaboratives. However, the greatest share of agency respondents had been involved in their collaborative for between 3 and 5 years, while the slight plurality of non-agency respondents had been involved for more than 5 years. The shorter duration of agency participation in their collaboratives may reflect the mobility of federal employees who move to different positions and geographic locations throughout their career. Fewer than 20% of respondents from both groups had less than a year of experience with collaboration. There was also no statistically significant difference in the pattern of participation frequency between agency and non-agency respondents (z score −0.164, p-value = 0.101). Respondents in both groups most frequently reported that they "nearly always" attended collaborative meetings over the last 24 months; majorities of both groups indicated they attended at least half of the time.

Collaborative Roles

Agency and non-agency respondents participating in collaboratives were consistent in typically considering themselves a member (as opposed to just a participant) of the collaborative (Table 3). However, agency respondents were significantly less likely to state that they were a voting member of the collaborative. For agency respondents who work for the Forest Service, this is consistent with agency guidelines for participating in collaboratives and following the FACA (Butler 2013). Both agency and non-agency respondents participated in collaborative subcommittees with similar frequency. Collaborative subcommittees often are a venue for more detailed research, discussion, and agreement-seeking on specific issues, and demand additional time from participants. Agency respondents were much more likely than non-agency respondents to view themselves as providers of technical and science support to the collaborative. Technical support for collaboratives can include activities such as providing information on agency policy or direction, making maps, or running ecological models. Science support can include conducting applied or basic research to inform collaborative decision-making, or providing and describing relevant scientific literature.

Motivations to Collaborate

Motivations to collaborate may also suggest the values that respondents hold, and the degree to which those are common across agency and non-agency collaborative participants. We asked respondents to select the key motivations that applied to them, and then select their single primary motivation. Of the 11 listed motivations, most were identified as a key motivation by less than half of agency and

non-agency respondents (Table 4). Overall, agency respondents selected fewer key motives for collaborating (Mann–Whitney U = 4404, p-value = 0.065) compared to non-agency respondents. Further, agency and non-agency respondents differed in their likelihood of selecting 6 of the 11 motives as key to their participation (Table 4). Agency respondents were significantly less likely than non-agency respondents to identify protection of wildlife habitat, improving recreational opportunities, maintaining public access, increasing say in public lands management, and protecting cultural resources as key motivations for participating in collaboratives. Conversely, agency respondents were much more likely to select improving relationships and trust as a key motive for collaborating. For the remaining five key motives, where responses were not statistically different between the two respondent groups, restoring forest resiliency was the most frequently selected motive for collaborating.

Agency and non-agency respondents differed in selection of the single primary motive for collaborating (Table 3). Non-agency respondents selected a diversity of single primary motives, with no single primary motive identified by more than 20% of respondents and all primary motives identified by at least one respondent. Agency respondents were more concentrated in their selection of primary motives. Forty-five percent of agency respondents cited "improving trust and relationships" as their primary motive for participating in collaboratives; just 14 percent of non-agency respondents cited that as their primary motive. "Getting more timber off public lands", which some critics and conservation

Table 4 Percent of agency and non-agency respondents who reported satisfied or dissatisfied on aspects of collaboration

Aspect of collaboration	Satisfied or very satisfied		Dissatisfied or very dissatisfied		Type III effects	
	Non-agency	Agency	Non-agency	Agency	Wald Chi-square	*P*-value
Overall satisfaction	62.6%	68.9%	19.4%	16.4%	1.48	0.476
Collaborative diversity	60.0%[a]	46.6%[a]	22.3%	27.5%	6.51	0.039
Collaborative staffing	51.2%	65.6%	19.6%[a]	6.8%[a]	10.87	0.004
Interaction w/ other collaboratives	40.5%[a]	52.7%[a]	9.9%	7.3%	4.89	0.087
Leadership within collaborative	77.3%[a]	86.2%[a]	8.6%	8.6%	6.24	0.044
Public outreach	39.6%[a]	54.3%[a]	15.7%[a]	20.3%[a]	12.85	0.002
Technical assistance availability	66.2%	69.0%	10.5%[a]	3.4%[a]	5.21	0.074
Types of projects	56.7%	59.4%	17.3%[a]	8.5%[a]	5.68	0.058
Agency commitment	79.5%	87.5%	7.1%	5.4%	3.72	0.156
Availability of funding	44.2%	38.6%	26.2%	22.8%	3.1	0.213
Clear consistent rules	70.9%	68.9%	8.7%	8.6%	0.2	0.907
Clear/feasible goals	61.9%	60.3%	13.5%	10.3%	1.41	0.493
Collaborative operation	52.6%	51.2%	9.1%	8.5%	0.67	0.717
Collaborative size	61.5%	67.2%	11.5%	6.9%	2.19	0.334
Collaborative trust	72.9%	70.7%	15.5%	13.7%	1.22	0.544
Data/information availability	66.1%	65.5%	10.5%	8.6%	0.51	0.774
Fairness of decisionmaking	73.4%	73.7%	10.9%	5.3%	4.22	0.122
Group relationship	80.0%	84.5%	10.8%	6.9%	1.56	0.459
Leadership stability	76.0%	79.7%	11.2%	5.1%	3.79	0.151
Member commitment	75.9%	74.1%	10.1%	8.6%	0.84	0.658
Quality of facilitation	71.7%	81.0%	10.3%	8.6%	4.38	0.112
Shared mission/vision	68.5%	67.8%	16.5%	13.6%	1.21	0.546
Transparency of process	77.2%	79.3%	11.0%	6.9%	1.77	0.413
Up to date with information	55.2%	61.8%	11.0%	10.9%	1.75	0.418
Use of committees	51.2%	57.4%	10.9%	5.6%	2.93	0.231

Note: 'Very satisfied' and 'very dissatisfied' are collapsed into satisfied and dissatisfied. Respondents could also select 'neither satisfied nor dissatisfied'

[a] Statistically different propensity for satisfaction or dissatisfaction for agency and non-agency respondents based on 95% confidence intervals for odds ratio estimates

groups suggest is a major purpose for collaboratives, was an infrequently cited primary motive for both respondent groups, as were other social or economic motivations (e.g., "to create more local jobs", "to reduce wildfire risk to communities"); despite these motivations being fairly common when selecting all motives. Respondents could also write in a primary motive for collaborating if it was not in the survey list. Six percent of agency respondents wrote in that their primary motivation for participating in forest collaboratives was meeting a job requirement.

Importance and Performance of Potential Outcomes of Collaboration

We used three-point scales to measure respondents' attitudes about the importance and performance of the collaborative for 15 different potential outcomes of collaboration that were recognized in previous research and in policy supporting collaboration in Oregon. We classified responses into one of nine potential importance/performance combinations (e.g., moderately important and very successful performance) for each potential outcome (Fig. 3).

The majority of respondents (both agency and non-agency) ranked 10 of the 15 potential outcomes as very important. This can be seen by the high shares of respondents on the right side panels of Fig. 3. Only "public support for the collaborative" did not receive a plurality of respondents stating that outcome was 'very important.' 'Getting projects implemented on the ground' was the collaborative outcome most commonly rated as 'very important' by members of both respondent groups—87% of non-agency respondents and 95% of agency respondents. In general, few respondents felt any outcome of collaboration was 'not important' (the left side panels of Fig. 3) Only 'increasing pace and scale of restoration,' 'public support for the collaborative,' and 'increasing public awareness of natural resource issues' were deemed not

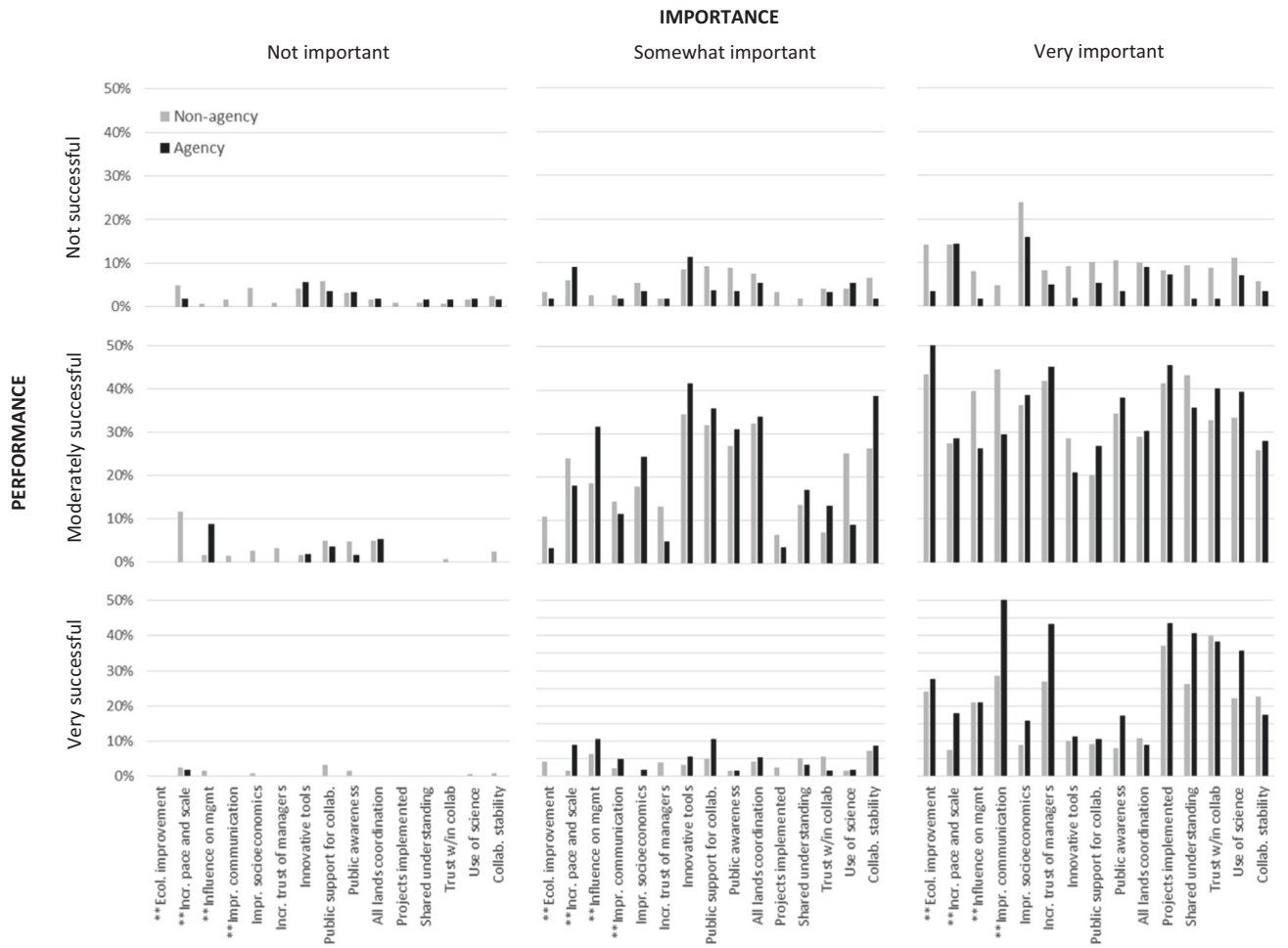

Fig. 3 Importance/performance ratings by agency and non-agency forest collaborative participants for 15 potential outcomes of collaboration. Asterisks (**) indicate statistically-significant differences (p-value < 0.05) in patterns of response for four outcomes: ecological improvement, increased pace and scale of restoration, more influence on management of Forest Service lands, improved communication with Forest Service managers

important by more than 10% of agency or non-agency respondents.

Both agency and non-agency respondents most typically rated collaborative performance as 'moderately successful.' However, agency respondents were more likely than their non-agency counterparts to give 'very successful' ratings of performance. Agency respondents were most likely (57% of respondents) to give a rating of 'very successful' to 'improved communication between the collaborative and the Forest Service.' Among non-agency respondents, 'building trust within the collaborative' was the outcome most frequently rated as 'very successful.'

The patterns of combined importance/performance ratings were statistically different between agency and non-agency respondents for 4 of the 15 potential outcomes (Fig. 3). About a quarter of both respondent groups stated that 'ecological improvement' was 'very important' and that collaboratives had been 'very successful' in achieving that outcome. However, non-agency respondents more frequently reported (1) the collaborative was not successful at this outcome and (2) it was only somewhat important. Agency respondents were more likely than non-agency respondents to state their collaborative had been 'very successful' at 'achieving pace and scale in restoration planning' and that outcome was somewhat to very important; non-agency respondents were more likely to state that achieving pace and scale was 'not important,' regardless of performance rating. About 20% of members of both respondent groups reported that having 'greater influence over Forest Service management decisions' was very important and the collaborative had been very successful at that outcome. However, (regardless of performance rating); agency respondents more frequently reported this outcome as 'somewhat important' or 'not important.' More than half of agency respondents felt that 'communication with the Forest Service' was a very important outcome of their collaborative effort and one the collaborative had been very successful at achieving. Just a little more than one quarter of non-agency respondents had this combined importance/performance rating for 'communication with the Forest Service.' Non-agency respondents were much more likely than agency respondents to report only moderate success in communication with the agency, regardless of importance rating.

Satisfaction with Collaboration

To further understand satisfaction with collaboratives and perceptions of their efficacy among collaborative participants, we asked respondents to rate their overall satisfaction with the collaborative, as well as their satisfaction for 25 specific aspects of collaborative governance that have been identified as important in previous research. Satisfaction was reported on a five point satisfaction scale. We collapsed the very satisfied and very dissatisfied response categories into satisfied and dissatisfied for statistical analysis.

More than 60% of both respondent groups stated they were satisfied or very satisfied overall with the collaborative (Table 4). For both groups, less than 20% of respondents stated they were dissatisfied or very dissatisfied overall with the collaborative. Agency membership was not a significant predictor of overall satisfaction or dissatisfaction. For all 25 specific aspects of collaboration, most respondents in both groups reported their satisfaction levels were at least neutral and more commonly satisfied or very satisfied (Table 4). Both groups reported the greatest satisfaction with the relationship among collaborative group participants (80% or more of respondents) and the commitment of the Forest Service to collaboration (79% or more of participants).

Whether a respondent participated in collaboration as an agency representative was a statistically significant predictor of satisfaction for 7 of the 25 aspects of collaboration. Fewer than half of agency respondents reported being satisfied or very satisfied with collaborative participant diversity; 60% of non-agency participants were satisfied or very satisfied with present diversity. Compared to their counterparts, agency respondents were more likely to be satisfied or very satisfied with the interaction of the collaborative with other collaborative groups, leadership within the collaborative, and public outreach of the collaborative. Non-agency respondents are more likely than agency respondents to be dissatisfied or very dissatisfied with collaborative staffing, the availability of technical assistance, and the types of projects addressed by the collaborative. Agency respondents were more likely to be dissatisfied or very dissatisfied with public outreach about the collaborative. Interestingly, most non-agency respondents reported they were neither satisfied or dissatisfied (i.e., neutral) with public outreach by the collaborative.

Discussion

Our study revealed some commonalities and differences in how agency and non-agency participants view forest collaboration in Oregon. Understanding these is important in regions where government agencies manage the land but are mandated to obtain public input. Oregon and other western states have increasing numbers of organized forest collaborative groups that offer this input, and agencies and stakeholders alike often commit significant time and resources to collaboration. We offer several implications of our findings.

First, we found that agency respondents were demographically distinct from stakeholders as they had higher incomes, were more likely to be female, and less likely to be over 65 years of age. It is likely that federal government wages would be higher than others in many rural areas, and mandated commitment to diversity is part of the agency's hiring practices. They may also contribute some slight gender diversity to collaboratives. But collaborative groups, broadly, are predominantly male. Despite agency participants adding some youth to collaborative groups, the majority of collaborative participants are still over 50 years of age. This suggests that agency participants, as individuals, may not always share the same socioeconomic status that other collaborative participants in rural areas may face, and that collaboration in part purports to address; however, more research would be needed to explore the impact of differences in income on collaborative participation, which is beyond the scope of our results.

Second, we found that agency participants were more likely to report that they were not voting members, and that they were there to provide technical assistance and science support. Previous research on agency roles in collaboration suggests that fear of violating FACA can keep agency participants in "arms-length" positions that may reduce their ability to help a collaborative succeed (Butler 2013), and that not identifying as a member of the collaborative group may also harm its ability to succeed (Wondolleck and Ryan 1999). But even if an agency participant does not vote, they may influence and/or assist a collaborative through provision of information, resources, and expertize, which they appear to be doing in Oregon collaboratives; and may still contribute to a group's success. There is no research to date on the specifics and outcomes of the science support and technical assistance roles that the Forest Service and other participants (e.g., nonprofit organizations or educational institutions) report playing. More study would be warranted to learn if these roles may be pivotal to collaborative success, and if they perhaps create different avenues of power and influence beyond voting; suggesting that they are not in-fact "arms-length" (Butler 2013).

Third, agency and non-agency respondents were not necessarily participating for the same reported motivations. Most notably, agency participants attended primarily to build trust and relationships, and had fewer overall motives for participation. This suggests that they identify the social process of collaboration as important, and value collaboratives most of all as a venue for social outcomes. Since trust is such a significant motive for agency participants, other research might examine if Oregon's collaboratives are in fact succeeding at building trust, and under what circumstances. As others have suggested, trust is not a one-dimensional issue, but rather depends on the characteristics of the trustor, trustee, and the situation (Stern and Coleman 2015). For example, we may posit that agency participants are focused on building social trust as an outcome in lieu of a lack of perceived dispositional trust (lack of a trusting tendency from the public) or rational trust (lack of perceived predictability or reliability of performance by agencies). Meanwhile, non-agency participants may emphasize the importance of procedural trust (transparent processes) as a mechanism to enhance public influence on agency decisions and outcomes. However, trust is not the only factor that research has identified as important for successful collaboration (Cheng et al. 2015; Conley and Moote 2003), and it was not the primary motivator of non-agency participants in our study. Therefore, more research into the importance of other motivations for collaborative success and the relative importance of trust to those would be useful.

Fourth, however, both agency and non-agency respondents infrequently chose any other social (aside from trust) or economic motivations as their primary reason for collaborating. Some of these motives were more frequently selected when respondents could select all motives; but, when forced to select a primary motive, they fell away. This is in interesting contrast to recent stakeholder critiques of forest collaboratives, e.g., "the over-riding goal has become economic return to local communities or the timber industry" (Coulter et al. 2015); and to the mission statements of many collaboratives themselves, which typically state the importance of economic and social outcomes of collaboration. This could suggest that these motives are in fact not as important as managers and policy makers may assume; or it may signify that collaboratives are seen as an indirect means to an end, in which the social outcome of increased trust is most important and if they provide that trust, that other social and economic outcomes will naturally follow. There is currently no research that parses out the implications of such differences in social, economic, and ecological motivations among collaborative participants.

Fifth, agency and non-agency respondents alike reported overall satisfaction with their collaborative's ability to achieve desired outcomes, which aligns with previous studies of satisfaction (e.g., McKinney and Field 2008; Susskind et al. 2003). For 25 specific aspects of collaborative governance queried, most respondents in both categories reported their satisfaction level was at least neutral and more commonly satisfied or very satisfied. But when asked to respond about performance rather than satisfaction, performance rankings on each of the outcomes were lower than the importance rankings for both agency and non-agency respondents, suggesting that collaboratives may not be fully delivering on some of the aspects of collaboration that are important to participants. Yet participating in collaboration appears to be creating an overall sense of satisfaction regardless of performance on important outcomes. Other research on collaboration has not explored

the relationship between reported satisfaction and measured outcomes at length.

Finally, from a methodological perspective, future research could build on our approach, re-examine our findings, and perhaps add deeper knowledge with a stratified random sample of agency and non-agency collaborative participants. We accessed the collaborative population by sending invitations to participate in this survey to all known collaborative participants included in each collaborative's email list-serve with no stratification for agency or non-agency individuals.

Conclusions

Taken together, our study results could signify several implications for the practice of public lands collaboration. First, more work is needed to understand how and through what roles agency participants—or any other stakeholders—may be still exerting power and influence despite not formally participating in decision making and ostensibly staying "at arms' length" (Butler 2013). While previous research has suggested collaborative processes on public land offer democratic avenues for citizens to participate in resource management, additional research might elucidate whether and how governmental and other technical/supporting actors continue to influence and shape management input (Parkins 2008). Collaborative forest management on public lands in the western US typically focuses on building collective input about desired actions and conveying it to federal agency managers.

Second, we found that stakeholders in Oregon's forest collaboratives do not consistently have similar traits and values—in particular, agency and non-agency participants differed demographically and in motivations for collaboration. Yet, the majority of participants reported satisfaction with the ability of their collaborative to achieve their desired outcomes, possibly indicating a shared belief in the collaborative process itself. The emphasis on trust as a primary motivation could also mean that agency participants in collaboratives do not fully recognize or invest in other motives and outcomes important to stakeholders. Since the Forest Service is the decision maker on national forests, agency personnel may assume they have earned trust simply by having an active collaborative at hand. Therefore, they may make decisions that do not achieve all the desired outcomes of other stakeholders. Moreover, trust remains challenging to document and evaluate, and is highly conditional, so proving that collaboration achieves this important outcome may be difficult. Our study contributes to the literature on trust by providing evidence to suggest that trust is not considered or valued to the same degree by various participants in a collaborative, namely agency and non-agency participants. However, the broader implication may be that trust alone does not motivate or satisfy collaborative stakeholders, and that the agency's focus on trust may limit their ability to meaningfully deliver on other outcomes and expectations that have brought stakeholders to the table. This may affect the willingness of stakeholders to participate in collaborative groups in the future.

Finally, collaboration as it is being practiced in Oregon may currently satisfy participants. However, reporting of satisfaction does not entirely align with respondents' perceptions of performance. It would appear that satisfaction with collaboration does not necessarily require achievement of specific performance outcomes. The fact that the collaborative exists and provides an opportunity to deliberate may be adequately satisfying and sufficient. With many collaborative groups in existence 5 years or less, expectations of outcomes may not be very high. In addition, collaboration is widespread and there are currently high levels of political and social support for it in Oregon. Therefore, merely practicing collaboration, regardless of outcomes, could be leading to a sense of satisfaction that something effective is being accomplished.

Collaborative natural resource governance in many forms has been celebrated for decades worldwide as a more democratic approach to management of state-managed natural resources. As collaborative management continues to expand in the United States, these groups become more institutionalized and organized, elicit increased investment, and also attract increased critique. There is a concomitant need to understand how they function, their outcomes, and if they share qualities affiliated with success in other studies of collaborative governance. This and other inquiry along the lines we have posed above should yield greater insights into the practice of collaborative governance in public land settings.

Acknowledgements This research was made possible by funding from Oregon State University's College of Forestry and by in-kind contributions to the analysis and interpretation from the US Forest Service Pacific Northwest Research Station. Figure 1 was designed and prepared by the Ecosystem Workforce Program, Institute for a Sustainable Environment, University of Oregon.

Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interests.

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