



# Organizational Change in the US Forest Service: Negotiating Organizational Boundaries in the Collaborative Process

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Received: 7 August 2017 / Accepted: 31 January 2019  
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## Abstract

In the United States and across the globe, forest governance officials are seeing a rise in the demand from local community members to participate in forest management decision-making. Despite this demand, there have been few studies that seek to describe the impact of community collaborative efforts on the organizational structures and processes of governmental forest management agencies. We empirically examined the boundary negotiations occurring at the field office level of the United States Forest Service in order to understand organizational change with respect to the collaborative process. We employed a qualitative case study approach encompassing the examination of three community collaborative groups. By examining the defining characteristics of organizational boundaries, we found that boundary negotiations are facilitating organizational change through individual-level learning and behavior changes. We present data suggestive of negotiations for boundaries of knowledge, responsibility, and capacity. Understanding the organizational outcomes of community collaboration will help forest managers respond and adapt to changing forest management strategies.

**Keywords** Organizational change · Collaboration · United States Forest Service · Natural resources management · Boundaries · Boundary negotiation

## Introduction

Forest governance globally is a mix of national government ownership and control, concessions to private industry actors for commercially valuable timber, and local community participation in decision-making (Agrawal et al., 2008; Edmunds and Wollenberg, 2004). On this latter point, government field officials face the challenge of implementing top-down national forest management policies while also responding to multiple and often conflicting demands of local community stakeholders (Biber, 2009). This fluid operating environment puts pressure on forestry agencies to regularly adapt in order to ensure their continued political, financial, and social support (Tsoukas and Chia, 2002).

This is of particular concern in the case of the United States Forest Service (USFS), the federal agency charged with stewarding 193 million acres of national forest and grasslands in the United States (U.S. Forest Service, 2017c). The National Forest and Grassland System is composed of nine Regional Offices, 125 Supervisor Offices, and over 600 Ranger districts (U.S. Forest Service, 2017a). The communities in which Supervisor Offices and Ranger Districts (field units of the USFS) reside have experienced changes in their attitudes and behaviors toward their role in decision-making due in part to increased stakeholder demands to become more involved in the management of public forest lands (Bengston, 1994; Cheng, 2006; Cortner and Moote, 1999). Since the early 1990s, the USFS has increasingly included community stakeholders in collaborative approaches to address these demands (Burns and Cheng, 2005; Leach, 2006; Selin et al., 1997; Wondollock and Yaffee, 2000). Despite its widespread application, few studies document organizational changes resulting specifically from the agency's engagement in collaborative efforts with community stakeholders.

Indeed, examinations of organizational change within the USFS have a long history, including how the agency has adjusted to changing court rulings, policy mandates, and

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**Supplementary information** The online version of this article (<https://doi.org/10.1007/s00267-019-01145-y>) contains supplementary material, which is available to authorised users.

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social values for national forests (Apple, 1996; Brown and Harris, 2000; Brown et al., 2010; Butler and Koontz, 2005; Farnham and Mohai, 1995; Farnham et al., 1995; Jones and Mohai, 1995; Kennedy and Quigley, 1998; Koontz and Bodine, 2008; MacCleery, 2008; Mohai, 1995; Mohai and Jakes, 1996; Sabatier et al., 1995; Salka, 2004; Vaughn and Cortner, 2004), the effect of USFS workforce diversification (Brown and Harris, 1993; Halvorsen, 2001; Kennedy and Quigley, 1998; Thomas and Mohai, 1995) and changes in USFS employee values and attitudes (Boyle, 1994; Chojnacky, 2012; Cramer et al., 1993; Davenport et al., 2007; Kennedy et al., 2005; Sabatier et al., 1995; Trusty and Cerveny, 2012; Xu and Bengston, 1997).

While such examinations have elucidated macro-level organizational changes in the USFS, the wide variation in collaborative engagement across USFS field-level collaborative contexts warrants examination of the “micro-processes” of organizational change at the field unit level (Moseley and Charnley, 2014). We define micro-processes of organizational change here as those changes brought about by small, often undocumented, daily activities of individuals within the organization. In this paper, we apply the concept of organizational boundaries and boundary negotiation as interpretive lenses through which to categorize the types of micro-processes of organizational change occurring within USFS field units resulting from community collaboration.

Understanding the micro-processes of organizational change resulting from community collaboration has implications for the long-term survival of the organization as organizations must be able to adapt to changing circumstances in order to persist. Additionally, the consequences of changes can affect the various actors tasked with carrying out the organization’s mission and functions (Huber et al., 1993; Weick and Quinn, 1999). As the communities in which USFS offices reside become increasingly involved in forest management decision-making, staff members and managers (line officers) are asked to step out of familiar roles and into collaborative positions and become a link between the community and the organization (Aldrich and Herker, 1977). Understanding these changes also has broader implications for examining how public organizations adapt in response to their involvement in collaborative arrangements (Bingham and O’Leary, 2006; Bryson et al., 2006; McGuire, 2006; Thomson and Perry, 2006).

## Organizational Change and Boundary Negotiation

Organizational change is herein defined generally, as the “reweaving of actors’ webs of beliefs and habits of action to accommodate new experiences obtained through interactions” (Tsoukas and Chia, 2002, p. 567) and specifically, as

a change in the way an organization functions, the form it takes, who its members and leaders are, or how it allocates its resources (Huber et al., 1993). Weick and Quinn (1999) characterize a continuous change framework in an attempt to capture the dynamic nature of the change process and aims to describe cumulative organizational changes that are evolutionary and ongoing and follow Orlikowski’s (1996) “situated change model”. The continuous change model is differentiated from other processual models in that it relies on the idea that “small continuous adjustments, created simultaneously across units, can cumulate and create substantial change” (p. 375). Indeed, organizational change from a continuous perspective accentuates the small, incremental, interminable actions that can culminate into substantial organizational transformation even when change is not intentional or defined a priori (Orlikowski, 1996). In this way, organizational actors are continuously negotiating and re-negotiating the organizational sphere and their role and space within it.

Barbara Gray (1989) invokes this concept of continuous re-negotiation of the institutional order of organizations involved in collaborative processes, contending: “...[N]egotiated order theory applied to interorganizational relations is concerned with change in the institutionalized order as constituted and with how such changes emerge” (p. 236). Gray goes on to explain how collaborative initiatives are essentially emergent interorganizational arrangements through which individuals are continuously re-negotiating the “growing complexity of their environment” (p. 236). This view of organizational change resulting from collaboration has been only indirectly applied to federal land agencies like the USFS (Cheng et al., 2015). The preponderance of scholarship in this topic area present normative claims about the ways in which agencies are embedded into communities and must address the varying values, priorities, and needs of community stakeholders (Frentz et al., 2000; Moseley and Charnley, 2014; Roth, 1991; Voth et al., 1994). But agencies must also balance the bureaucratic charge to be accountable to national standards, laws, and budgets with the community’s demand to be responsive and flexible.

Negotiating this tension with community collaborators is a significant challenge to public agencies and requires them to redefine their organizational boundaries (Aldrich and Herker, 1977; Dudley and Raymer, 2001; Kettl, 2006; Langford and Hunsicker, 1996; O’Flynn et al., 2014; Quick, 2011; Quick and Feldman, 2014). Boundaries are often used for purposes of separating who is in and who is out of an organization (Clarke and McCool, 1996), a distinction that risks becoming obfuscated in a collaborative setting (Quick and Feldman, 2014). Boundaries are also used for demarcating the policies and actions of actors within the organization (Heracleous, 2004). At its most basic function,

the organizational boundaries of a bureaucracy serve to distinguish the government from the citizens it serves (Kettl, 2006). As Aldrich and Herker (1977) note,

“Boundary roles involved with maintaining or improving the political legitimacy or hegemony of the organization not only represent the organization, but also mediate between it and important outside organizations. The term “mediate” refers here to aspects of the boundary role involving negotiations that will eventually affect the power of the focal organization vis-à-vis another organization or group” (p.220).

Therefore, the “negotiation” to which we refer is the result of continuous communication and interaction with community stakeholders about expected organizational roles and duties than a set event. Indeed, Quick and Feldman (2014) contend that in collaborative public management, “Public managers negotiate these boundaries as a form of ‘boundary work’, a term coined by (Gieryn, 1983) Gieryn (1983) to describe the dynamic negotiation of sites of difference” (p. 2).

What do these boundaries look like? Langford and Hunsicker (1996) identified boundaries of information, perception of environment, organizational strategies, organizational structure, regulations, current vision, mission, structure, processes, and culture. Aldrich and Herker (1977) note that innovation within, and structural changes to, the organization often resulted from information that is brought back to the home organization by boundary spanning personnel. Kettl (2006) presents five fundamental boundaries that he argues have been historically important in shaping the behavior of American administrative institutions: mission, resources, capacity, responsibility, and accountability. While these classifications provide an overview of the different types of boundaries discussed in the literature, their abstract nature presents a problem to the researcher wishing to observe or measure boundaries. Organizational boundaries are complex, dynamic properties that emerge through negotiations between actors (Aldrich and Herker, 1977; Heracleous, 2004; O’Flynn et al., 2014; Quick and Feldman, 2014). Therefore, in order to observe or measure a boundary, a researcher must parse out the emergent properties of a specific boundary as the unit of analysis by situating it within a social negotiation process.

In this article, we draw upon findings from three in-depth case studies of national forest-community collaboration to identify the types of organizational boundaries being negotiated during the collaborative processes as well as the defining characteristics of those boundaries. Describing and understanding the types and dynamic status of

organizational boundaries as experienced by field personnel affords the agency a window into its own challenges and opportunities pertaining to collaboration. Empirically examining boundary negotiations of an agency can also advance broader organizational and public administration theory. Our inquiry is framed by the two following research questions: (1) What types of organizational boundaries are being negotiated by USFS field-level personnel resulting from their engagement in collaborative efforts?; and (2) What are the defining characteristics of the organizational boundaries being negotiated?.

## Methods

Because of a relative scarcity of existing studies documenting the organizational changes and adaptations made by any federal natural resource land management agency as a result of their engagement with community collaboration, this study employs qualitative research methods applied to a sampling of case studies.

## Case Study Descriptions

Three case studies encompassing the USFS and community collaborative efforts were selected (Table 1). Conley and Moote (2003) note that collaborative efforts were defined as those employing on-going “multiparty natural resource management projects, programs, or decision-making processes using a participatory approach” (p. 372). Potential case studies were selected from a pool of collaborative efforts that shared similar focus and purpose of working with their respective national forests on forest restoration issues. Because there is not a publicly-available registry or database of national forest collaborative efforts around forest restoration, we derived the pool from the National Forest Foundation (NFF), which has operated a collaborative capacity assistance program since the mid-2000s. Through this program, the NFF has assembled a list of between 35–40 collaborative groups working on forest restoration.

We developed several criteria for selecting which case studies would be best suited for this exploratory investigation in order to conduct a compare and contrast analysis (Seanwright and Gerring, 2008). By selecting different regions of the USFS, we were interested in examining if organizational changes via boundary negotiations were common across regions. The cases also vary in time since inception (years active). We chose cases with differing times since inception to explore the types of organizational change that might occur at different phases of collaboration, as proposed by Imperial and Koontz (2007). From a practicality stance, it was imperative that the collaborative group

**Table 1** Summary of characteristics of case studies

Group name (Pseudonyms)	USFS Group mission/focus region	Years active	Type of participants	Agreements between USFS and Collaborative Groups
Northmont Forest Restoration Coalition (NFRC)	Demonstrate the full potential of restoration forestry to enhance forest health, public safety, and community economic vitality.	2002 - Present	USFS agency representatives, timber industry, environmental community	Memorandum of Understanding and "Collaborative Work Plan" (a pseudonym)
Lone Mountain Forest Restoration Collaborative (LMFRC)	Enhance forest health and local economies in the county through stewardship contracting and restoration activities	2006 - Present	USFS and other federal agency representatives, landowners, timber industry, environmental community, community leaders, non-federal government representatives	Memorandum of Understanding
Meadow Valley Forest Collaborative (MVFC)	Use collaborative approaches to improve the health and long-term resilience of mixed-conifer forests and the communities located near them.	2010 - Present	USFS agency representatives, landowners, timber industry, environmental community, scientists, community leaders, elected officials, non-federal government representatives	No agreement at the time data were collected.

and the corresponding national forest be amenable to the idea of being studied.

A few caveats of note: this study focuses only on the Ranger District and Supervisor Office levels of the USFS in each case study. While organizational changes may be occurring at higher levels of the USFS, this line of inquiry was beyond the scope of this study. It is also important to note that our inquiry only investigates three case studies, thereby limiting generalizability. We suggest however, that examining these same research questions at different levels within the bureaucratic hierarchy and across a wider sampling of cases would be an interesting line of inquiry for future studies.

Because of the contentious histories and sensitive nature of issues discussed by some of the interviewees, we use pseudonyms for each of the collaborative groups and the national forests (Kaiser 2009). The three case studies that were chosen as units of analysis were the: (1) Northmont Forest Restoration Coalition (NFRC) - USFS Region 6; (2) Lone Mountain Forest Restoration Collaborative (LMFRC) -USFS Region 4; and (3) Meadow Valley Forest Collaborative (MVFC) -USFS Region 2 (U.S. Forest Service, 2017b).

### Northmont Forest Restoration Coalition

The NFRC collaborates with the Bear Valley National Forest (Bear Valley) in the northwest region of the United States and is the oldest collaborative effort among the three case studies. The community in which the Ranger District and Supervisor Offices reside has a population of just below 5000 people and most employment in the area relies on the timber, agriculture and mining industries, along with state and national government offices. Some cattle, horse, and hay production can also be found in the area. The community has a long history of timber production, which is still active today and vital to the community's economy. The timber industry in the area has experienced dramatic changes in production from federal forest lands and the region figured prominently in the "Timber Wars" of the 1980's and 90's. The relationship between the timber industry and environmental groups has been a contentious one and the area has a long history of conflict between the two entities. The NFRC was founded in 2002 for the purposes of ameliorating this conflict and for improving forest health through restoration practices, protecting the community from wildfire, and creating community economic viability. At the time of this study, the NFRC consisted predominately of representatives from the timber industry and conservation interests. In 2003, the NFRC and the Bear Valley formalized their working relationship by signing a Memorandum of Understanding (MOU). MOU's seek to define the expected actions between two or more parties

engaged in a specific agreement. In 2006, the NFRC developed a collaborative process protocol that further describes their process for working collaboratively with the forest. The NFRC and the Bear Valley have collaborated on over 25 forest management projects to date, ranging from stewardship contracting to forest planning.

### Lone Mountain Forest Restoration Collaborative

The LMFRC was formed in July 2006 and collaborates with the River Point National Forest (River Point) in the intermountain west region of the United States; it represents a “middle-aged” case study. The community in which the USFS offices reside has a population of just over 3000. The area’s current economy is based chiefly on ranching with some minor logging and mining operations. Until the mid-1990’s, the area was home to several, small, locally owned sawmills, log home manufacturers, post-and-pole operations, and commercial firewood businesses which provided employment for the community’s citizens. Mill closures in the late 1980s and early 1990s cost the local economy 250 jobs. Today, the remaining forest product businesses lack the capacity to process enough timber to make a large contribution to the area’s economy. Recreation and tourism are now the majority contributors to the area’s financial resources. With declining timber production the River Point saw increased forest health and wildfire issues. Although the issues have changed in recent years, many of the old conflicts persevered. Today the LMFRC is a self-governed group comprised of landowners, timber industry representatives, retired USFS personnel, the environmental community, non-federal government entities, and community leaders. The LMFRC, through an MOU between the River Point and the collaborative group, works to restore the forest to a condition that mimics the historic range of variability in terms of stand structure, composition, and disturbance regimes. At the time of this research was conducted, the LMFRC had completed one major restoration project with two more slated as future activities.

### Meadow Valley Forest Collaborative

The MVFC is the most newly formed of the collaborative efforts studied, with inauguration in the fall of 2010. The MVFC works collaboratively with the Sunset Ridge National Forest (Sunset) in the Rocky Mountain region of the United States. The community from which this case study operates has a population of ~1700 people. Contrary to the first two case studies, this collaborative effort was born out of a proactive desire to address forest issues rather than a reactive need to resolve conflict. Historically, the community in which the District Ranger office of the USFS, and to some degree the community in which the

Supervisor’s Office reside, were lumbering communities. The area experienced intensive, albeit short-lived, logging between 1890 and 1945. By the 1970s, a dwindling supply of large-diameter trees spelled the end of major logging operations in the area. Today, the forest provides recreational and aesthetic benefits to the community’s citizens, many of whom have taken an interest in forest health issues on the Sunset. The MVFC was established to include stakeholders’ perspectives and to collaboratively develop science-based forest management priorities. One of the group’s early successes was the award of a long-term stewardship contract in June of 2012.

### Data Collection and Analysis

Data were collected between March and August 2012 using qualitative social science research methods encompassing semi-structured individual interviews (Kvale and Brinkmann, 2009) and participant observation of group meetings (Kvale and Brinkmann, 2009; Spradley, 2016). Written reports created by the collaborative groups, meeting minutes, and MOUs for the NFRC and the LMFRC case studies were also collected. We received Institutional Review Board approval to collect these data from the Research Integrity and Compliance Review Office of Colorado State University. At the time data were gathered for this study, the MVFC did not have a signed MOU with the USFS. The intent of adding these documents to the analysis was to enhance the reliability of results by data triangulation (Golafshani, 2003). We conducted 26 semi-structured, open-ended interviews across the three cases (Table 2). Interviews were conducted until we reached a point of near saturation and when little new information was being collected (Mason, 2010). Of the 26 interviews, 16 were with agency personnel (staff and line officers) and 10 were with community stakeholders. Interviews were conducted by a single researcher. The interviews resulted in 18 h and 35 minutes of audio recordings that were transcribed verbatim. Interview questions were exploratory in nature and were organized around four question categories: (1) interviewee’s background; (2) organizational change; (3) enablers and barriers of organizational change; and (4) barriers and opportunities for organizational change (Appendix A).

We chose interview respondents by both purposive and network sampling (Granovetter, 1976). A key contact from each stakeholder group was determined based on previous knowledge of the cases by the authors. These key informants were contacted and they, in turn, provided a list of other group members. Similarly, we identified the key USFS contact in each group and they provided us with a list of potential USFS interviewees. While asking key informants to provide names of others who may be willing to be

**Table 2** Case studies, affiliation, and position of key informants

Case study	Affiliation	Position
NFRC <sup>a</sup>	USFS <sup>b</sup>	Line Officer <sup>c</sup>
NFRC	USFS	Line Officer
NFRC	USFS	Line Officer
NFRC	USFS	Staff <sup>d</sup>
NFRC	USFS	Staff
NFRC	USFS	Staff
NFRC	USFS	Staff
NFRC	NGO <sup>e</sup>	Executive Director
NFRC	Consulting Firm	President
LMFRC <sup>f</sup>	USFS	Line Officer
LMFRC	USFS	Line Officer
LMFRC	USFS	Staff
LMFRC	USFS	Staff
LMFRC	Local Government	County Commissioner
LMFRC	NGO	Executive Director
LMFRC	NGO	Public Lands Director
LMFRC	Retired USFS	Citizen
MVFC <sup>g</sup>	USFS	Line Officer
MVFC	USFS	Line Officer
MVFC	USFS	Staff
MVFC	USFS	Staff
MVFC	USFS	Staff
MVFC	Local Business	Owner
MVFC	Retired USFS	Citizen
MVFC	Retired Academic	Citizen
MVFC	Retired USFS	Citizen

<sup>a</sup>Northmont Forest Restoration Coalition

<sup>b</sup>United States Forest Service

<sup>c</sup>Line officers may include USFS personnel with titles of District Ranger, Forest Supervisor, Deputy Forest Supervisor, Regional Forester, or Deputy Regional Forester.

<sup>d</sup>Staff may include USFS personnel with titles of resource specialists, planners, silviculturists, and administrative personnel.

<sup>e</sup>Non-governmental organization

<sup>f</sup>Lone Mountain Forest Restoration Collaborative

<sup>g</sup>Meadow Valley Forest Collaborative

interviewed was imperative to increasing our sample size, this method does introduce an inherent bias into our data collection (Atkinson and Flint, 2001). All identified persons were contacted via email or telephone. In all three case studies, we timed our field visits to coincide with collaborative group meetings, which we attended. In addition to the group meetings, we attended a joint meeting of the NFRC and the USFS. Interview notes were transcribed verbatim into a text format for content analysis and coding. Ground-truthing or “member checking” of interview data

was accomplished by sending transcripts to each respective interviewee (Vogt and Johnson, 2011). Changes were made to the final transcripts based on interviewee comments and suggestions.

We conducted a content analysis via coding and constant comparison (Hsieh and Shannon, 2005) for 26 interviews and all generated and collected documentation employing a modified grounded theory approach (Strauss and Corbin, 1990). We subjectively interpreted the text of all of our collected data by systematically coding to identify patterns and themes (Hsieh and Shannon, 2005). We modified the coding process as described by grounded theory in that, in addition to identifying emergent codes, we developed a priori codes based on the sensitizing concepts derived from the literature and structurally driven codes that were derived from our research goals and questions (DeCuir-Gunby et al., 2011).

## Results

Our analysis revealed that boundary negotiations and subsequent organizational changes occurred in nuanced, yet significant ways. Interviewees from all three case studies provided us with information that indicates that three organizational boundaries are indeed being negotiated and that the behaviors of USFS personnel have changed leading to continuous organizational change. Below we present selected quotations from interview subjects that illustrate how boundary negotiations are experienced by those directly involved in the collaboration process between the USFS and community stakeholders. These quotations from interviewees are presented using non-identifying means to protect the anonymity of participants as previously discussed. Data obtained from MOUs are also presented.

Several defining characteristics of boundaries emerged during the coding of our data. Our first research question asks what types of boundaries are being negotiated. Using an inductive process, we categorized these characteristics into boundary types. Three predominant boundary types emerged from the coding analysis of interviews and documents and across all case studies: (1) knowledge; (2) responsibility; and (3) capacity. Table 3 describes the number of times interview participants mention boundary negotiations and the boundary type that is being mentioned as determined by our inductive analysis of the defining characteristics of boundaries. Our second research question aims to identify the defining characteristics for each boundary type resulting from boundary negotiations. Table 4 presents the number of quotations found in each data source by boundary type and defining characteristics across all case studies.

**Table 3** Number of interview participants mentioning each boundary type (Total  $n = 26$ )

	Knowledge	Responsibility	Capacity
NFRC <sup>a</sup> —USFS Line Officer ( $n = 3$ )	3	3	3
NFRC—USFS Staff ( $n = 4$ )	3	4	4
NFRC—Non-agency ( $n = 2$ )	0	2	1
LMFRC <sup>b</sup> —USFS Line Officer ( $n = 2$ )	2	2	2
LMFRC—USFS Staff ( $n = 2$ )	2	2	2
LMFRC—Non-agency ( $n = 4$ )	2	1	3
MVFC <sup>c</sup> —USFS Line Officer ( $n = 2$ )	2	2	2
MVFC—USFS Staff ( $n = 3$ )	2	3	2
MVFC—Non-agency ( $n = 4$ )	1	1	2

<sup>a</sup>Northmont Forest Restoration Coalition

<sup>b</sup>Lone Mountain Forest Restoration Collaborative

<sup>c</sup>Meadow Valley Forest Collaborative

**Table 4** Number of quotes found in each data source by boundary type and defining characteristic

Boundary type	Defining characteristic	Number of interviewees mentioning a defining characteristic $n = 26$	Number of quotes in interviews	Number of quotes in MOU's	Number of quotes in meeting minutes	Number of quotes in participant observation notes
Knowledge	Providing information to the collaborative group beyond regulated requirements	NFRC <sup>a</sup> = 3 LMRFC <sup>b</sup> = 1 MVFC <sup>c</sup> = 2	NFRC = 5 LMRFC = 2 MVFC = 2	NFRC = 4 LMRFC = 4 MVFC = 0	NFRC = 2 LMRFC = 2 MVFC = 0	NFRC = 2 LMRFC = 3 MVFC = 1
	Receiving information from the collaborative group	NFRC = 2 LMRFC = 2 MVFC = 2	NFRC = 4 LMRFC = 1 MVFC = 2	NFRC = 0 LMRFC = 2 MVFC = 0	NFRC = 0 LMRFC = 5 MVFC = 0	NFRC = 0 LMRFC = 0 MVFC = 1
	Presence of MOUs	NFRC = 5 LMRFC = 2 MVFC = 0	NFRC = 7 LMRFC = 5 MVFC = 0	NFRC = N/ A <sup>d</sup> LMRFC = N/A MVFC = N/A	NFRC = 3 LMRFC = 1 MVFC = 0	NFRC = 0 LMRFC = 0 MVFC = 0
Responsibility	Increase in workloads of USFS line officers and staff	NFRC = 7 LMRFC = 3 MVFC = 4	NFRC = 10 LMRFC = 6 MVFC = 6	NFRC = 9 LMRFC = 8 MVFC = 0	NFRC = 0 LMRFC = 0 MVFC = 0	NFRC = 3 LMRFC = 2 MVFC = 2
	Increase in funding	NFRC = 4 LMRFC = 4 MVFC = 3	NFRC = 6 LMRFC = 8 MVFC = 9	NFRC = 0 LMRFC = 0 MVFC = 0	NFRC = 6 LMRFC = 3 MVFC = 1	NFRC = 2 LMRFC = 0 MVFC = 0
	Community stakeholders performed restoration tasks and will potentially monitor outcomes	NFRC = 8 LMRFC = 5 MVFC = 2	NFRC = 13 LMRFC = 7 MVFC = 4	NFRC = 2 LMRFC = 0 MVFC = 0	NFRC = 5 LMRFC = 5 MVFC = 1	NFRC = 2 LMRFC = 1 MVFC = 1

<sup>a</sup>Northmont Forest Restoration Coalition

<sup>b</sup>Lone Mountain Forest Restoration Collaborative

<sup>c</sup>Meadow Valley Forest Collaborative

<sup>d</sup>Not Applicable

### Negotiating Boundaries of Knowledge

The boundary of knowledge, or who knows what, is one of the founding principles of the USFS and is exemplified by the agency's "culture of expertise" (Cortner and Moote, 1999; Kaufman, 1960; Voth et al., 1994). The development

of expert knowledge on the part of agency specialists has traditionally demarcated a separation between the agency and the public it serves (Kaufman, 1960). The findings from this study suggest the boundary of knowledge is being negotiated by USFS agency personnel and non-agency stakeholders and that some stakeholders are seeking to become experts in their own right.

Providing information to the public is not a new function for the USFS, as federal law and administrative regulations require all federal agencies to conduct public disclosures of proposed actions (e.g.; Council of Environmental Quality administrative regulations pursuant to the National Environmental Policy Act) (CEQ, 2007). However, interviewees note that the information currently being shared with stakeholders goes well beyond that which has been traditionally transferred during regulated review and comment procedures, suggesting that the public is demanding to be more intimately involved in aspects of planning and implementation of projects on national forests. Because collaborative processes allow community stakeholders to be involved in the decision-making process prior to the traditional public comment period they are requesting more and different kinds of information. Most of the collaborative group members do not have the same level of expertise as the USFS when it comes to project planning and implementation and USFS staff members noted that they spend extra time educating the collaborative groups about silvicultural concepts, wildlife habitat requirements, and fire ecology. In essence, at least some collaborative group members are attempting to become experts themselves.

Three USFS staff members and three USFS line officers mentioned that they routinely share data and information with stakeholders that they would not traditionally share. This finding was consistent across all three case studies, however; three of the six interviewees noting this boundary negotiation were from the NFRC (Table 4), the oldest of the three case studies. One USFS staff member involved with the NFRC commented that:

“Just from an educational standpoint, we’ve had to educate the [collaborative group] on terminology, data, and research, so that they can understand why we do what we do and what our justifications are. We create tons of tables, GIS layers, and all kinds of stuff to help accommodate their data needs”.

One USFS line officer noted that the collaborative group expects to participate earlier and with greater detail in the NEPA process than in the past including walking the ground with USFS staff and going tree by tree to decide what to cut.

Our data suggest that the stakeholders are not only recipients of information, but that they also transfer information to the USFS. Six USFS interviewees commented that they receive information from stakeholders (Table 4). These findings were consistent and equally divided across all three case studies. While stakeholders have traditionally relayed information to the USFS through the comment and review period of proposed actions, the interaction and relationship building aspects of the collaborative process

allows for a deeper level of understanding of the information received from stakeholders. One USFS staff member working with the MVFC reflected that the collaborative process facilitates learning about factual knowledge and about the community’s perspective of the forest.

Community stakeholders are also proactively presenting their desires and expectations to the USFS, prior to the traditional comment period, sometimes in quite substantial ways. In discussing the collaborative group’s involvement with recommendations for stewardship contracting, an interviewee from the LMFRC who was representing a non-governmental organization stated:

“We informed the USFS that we want to do forest restoration using the stewardship contracting tool whenever possible. This forest was not at all familiar with stewardship contracting... Contracting wasn’t being used because we don’t have a lot of value in our timber at this point. But, we wanted it to be used because that was one of the few ways we could insist on best-value criteria. So, our group created a recommendation memo on a specific restoration area outlining how to use the stewardship contracting... We gave the recommendation memo to the Forest Service before they started the NEPA process... That was one area where the Forest Service definitely changed the way they do business.”

In this example, the collaborative group was not only expressing their desire to use stewardship contracting, but there was also an element of the collaborative group educating the USFS how to best utilize one of its own administrative tools. As a result, the USFS began using stewardship contracting, and at the time this research was conducted was continuing to do so, suggesting a durable change in the organizational processes directly attributable to the collaborative process.

### Negotiating the Boundaries of Responsibility

Boundaries relating to responsibility seek to define what actions are taken and by whom. Kettl (2006) states that, “With networks increasingly sharing the job of service delivery, it becomes more difficult for administrators in government – or in one of the legion of government’s private and nonprofit partners – to determine their role in contributing to a program’s success” (p. 16). Kettl (2006) goes on to say that it is imperative to define the boundaries of responsibility if partnerships are going to function efficiently and effectively.

One defining attribute of boundaries of responsibility between the USFS and the collaborative groups is the presence of MOUs. MOUs serve a dual purpose in relation to

boundary negotiation. MOUs can help define the loci along the organizational boundary of responsibility where negotiation is possible, effectively negotiating the “decision space” between the agency and the collaborative group. In direct opposition to this shared responsibility premise, MOUs can also reinforce and solidify boundaries between the agency and the collaborative limiting actions of both parties. At the time this research was conducted, two of the three case studies examined in this study, the LMFRC and the NFRC, had MOUs in place with their corresponding forests. The third case study, the most newly formed of the three, had not yet developed an MOU but planned to do so in the future.

The MOU which was negotiated by the NFRC and the USFS contains language that indicates that the collaborative group and the USFS cross the boundary of responsibility to the degree that the stakeholder group is involved in defining the core direction that the agency will undertake in forest management decisions. The MOU highlights that the USFS will, in cooperation with the collaborative group, determine the ecological conditions of forest landscapes and will jointly facilitate public discussions to determine desired future conditions of forest lands. Further highlighting the influence that this collaborative group has in USFS decision-making, a USFS staff member indicated:

“One of the things that the silviculturists are having a hard time with is we have less and less money to do the actual implementation, so we are going to stewardship contracting, not marking trees, that kind of thing. But we are having to do more and more detailed and precise prescriptive things to meet some of the requirements of the [collaborative group]. Whereas before we didn’t have to put them in the contract and we were able to mark that stuff in, less formally. But now we have to put their requirements in the contract. ... If the USFS is doing it all themselves, we would have a lot more control over these factors than we do now.”

In contrast, the MOU for the collaborative group in the LMFRC acknowledges the involvement of the collaborative group in the decision-making process, but defines the limits of the expected involvement of the collaborative by indicating that the agency will consider the input from the collaborative group, but the influence over the content of the management decisions is less so than in the case study mentioned above.

The following quotation from a community stakeholder participant of the LMFRC further illustrates this point.

“Really, this is kind of a local focus group on forestry, saying ‘Hey, if you had to do something in this

landscape, what would it be?’ ‘I don’t know. What’s the Forest Service say?’ ‘The Forest Service provides maps and things.’ ‘What about this and this?’ ‘Well, how are you going to address the road issue and the wildlife issues?’ Then we come up with some ideas further informed by presentations from USFS officials. Then we come up with some recommendations and basically transfer them through this blood-brain barrier to the agency, like ‘Hey, we’re just a group of folks on the ground who are interested. Here are some recommendations to how we might proceed here. This is not to take away your responsibility to go through the NEPA process and involved the public on public lands. But for our local concerns, this would address the majority of our issues here.’ I think that’s an important thing to state that basically in some ways these are recommendations to the agency. They’re not the agency’s only recommendations. They would inform the agency’s recommendations.”

In sum, MOUs seek to more clearly define boundaries between the USFS and community collaborative groups. They effectively serve as a portal through which expectations, communications, interactions, and resources travel between the USFS and the collaborative groups. Comparing the two MOU examples, the first commits the USFS to specific activities and outputs, whereas the second paints broader, more generalized expectations.

While MOUs help to define boundaries between the agency and the collaborative groups, boundaries of responsibility also exist within the agency itself. These boundaries also seek to define who does what. An increase in the assignments, tasks, and time spent in meetings that USFS employees are asked to perform as a result of their involvement with community collaboration groups was noted by 14 of the 16 agency personnel interviewed. This finding was consistent across the three case studies examined although 7 of the 14 personnel were from NFRC and included both line officers and staff (Table 4). One staff member from the LMFRC described his observation of the impact collaboration has had on the workload of USFS employees in the following quotation.

“There are lots of pitfalls to be had with the collaboration. The biggest thing that I see is it is a lot more work and with an agency that’s in financial difficulty – we’re asking way more of our employees than we did in the past.”

The increase in workload was not only expressed by staff, but by line officers as well as is evidenced by the following quote from a line officer who collaborates with the LMFRC.

“After every meeting I have tasks, additional tasks that come about so I know that [the collaborative] involvement always is going to require more work.”

The following quote from a USFS staff member from the MVFC notes that not only have workloads increased, but the nature of the work may also be different.

“The collaborative definitely has added to my overall workload. It’s also a different kind of work. If we hadn’t worked with the group, we might have ended up an appeal on that decision. So my workload may have gone from dealing with an appeal, if not litigation on a court case, to working with a group collaboratively and getting to know some different folks in the community and coming to a better understanding of forest management.”

### Negotiating Boundaries of Capacity

In order to accomplish its mission, an organization must have the capacity to get work done (Kettl, 2006). Our case study data suggest that the USFS is negotiating the boundary of capacity was found in all three case studies. All interviewee categories and across all three case studies discussed ways in which the collaborative group brings resources to the USFS to ensure that agreed-upon projects have the resources to be implemented in the face of agency capacity shortfalls (Table 4).

In 2006, the LMFRC became involved in a collaboratively planned 13,000-acre forest restoration and monitoring project that sought to reduce the density of vegetation to inhibit potential crown fire occurrence and reduce the potential for fire spread within the watershed and surrounding communities. A retired USFS staff member who is now an active member of the collaborative group discusses the difficulty that the USFS had in getting this restoration project off the ground, which led to the collaboratively designed restoration project:

“Before they got involved with [collaborative group] the USFS had been trying to use a stewardship contract in [watershed]. But, for a number of reasons, mostly internal to the USFS in this region, they had a lot of trouble getting that done, so they opted then to go with a stewardship agreement with the [non-governmental organization] which turned out to be fairly short lived. Eventually, the project was developed with the [collaborative group].”

Because of the collaborative relationship between the USFS and the LMFRC, the restoration project was able to

move forward without objections or litigation. Further to the point of negotiating the boundary of capacity, several members of the collaborative group contribute in-kind time, energy, and funding to implement projects on private property adjacent to USFS land, including restoring streams and treating noxious weeds. When neighboring landowners take restorative actions on their properties, it provides an impetus for the USFS to invest matching funds and actions in order to create a larger spatial impact on improving watershed conditions.

A USFS staff member who collaborates with the NFRC noted that the agency was having trouble getting restoration and other work accomplished because “to a significant extent we have capacity issues”, referring primarily to financial capacity shortfalls. Another USFS staff member within the same case study noted that the forest was able to receive Collaborative Forest Landscape Restoration Program (CFLRP) funding because they had an established relationship with the collaborative group. He is quoted as saying,

“Typically, some of the projects that were collaborated on already - we wouldn’t be implementing them unless we had money set aside. So these CFLRP dollars increase our capacity to complete some of those restoration projects that we wouldn’t have received dollars to implement. Our work with the [collaborative group] allowed us to get that funding.”

One representative of a non-governmental agency also commented that, “Some of these projects that were collaborated on already... we wouldn’t be implementing them unless we had money set aside [for collaborative efforts]. So these dollars increase our capacity to complete some of those restoration projects that maybe we wouldn’t have received dollars to implement.

A retired USFS staff member who is now an active member of the MVFC talked about future monitoring work and the importance of the collaborative group in accomplishing treatments on the forest.

“I think we’ll end up with some multi-party monitoring. You’ve heard that discussion. I think people want to do it. We just need to have some resources in place before starting out. I mean, the other thing that’s really come out of the relationship with the group that’s been really helpful overall, is has allowed us to do a lot of the treatments that needed to be done...and I think, just the very existence of the group helped make that happen.”

These data suggest, that for the three cases examined here, the USFS has been able to negotiate their boundary of

capacity and increase the amount of restoration actions, and potentially monitoring work, that otherwise may not have been accomplished as remarked by interviewees. In some instances, the restoration work was physically carried out by non-agency collaborative group members on private property adjacent to national forest land that aided in implementation of a fire reduction strategy. In other situations, treatments were carried out with funding received through monetary schemes that required collaborative group involvement. While the type of capacity (funding, lack of litigation, on-the-ground-work) varied between the three case studies, all three case studies experienced greater capacity resulting from the boundary being negotiated.

## Discussion

We have presented data that suggest organizational boundaries of the three cases examined are being negotiated by USFS personnel and community stakeholders as they engage in collaborative efforts of national forests. This study demonstrates several key findings, some of which are in agreement with previous research, and some of which are novel. Some of our findings describe known outcomes of collaboration, but by presenting them in the context of organizational change, we spotlight the importance that these outcomes have on the agency's employees and policies. The data suggest that the offices of the USFS in this study are negotiating the boundaries of knowledge, responsibility, and capacity as they engage in collaborative decision-making.

While Kettl (2006) provides general categories of administrative boundaries, this study makes explicit the characteristics of boundaries. Kettl (2006) and Langford and Hunsicker (1996) describe the boundaries of knowledge, responsibility, and capacity in a generalized fashion. This study further characterizes these boundaries by examining the "micro-processes" of social interactions and behaviors between USFS personnel and community collaboration stakeholders (Moseley and Chamley, 2014). The data presented here suggest that the organizational boundaries are not static, clearly defined demarcations, but are continuously negotiated and renegotiated through interactions between agency personnel and community stakeholders.

The boundary of knowledge has historically separated the USFS and the public it serves due to the USFS's concentration of scientific and technical forestry expertise and the public's trust in that expertise (Clarke and McCool, 1996; Cortner and Moote, 1999; Kaufman, 1960; MacCleery, 2008). Our study demonstrates that this boundary is being negotiated by both agency personnel and community stakeholders. For all three case studies, these

negotiations create tensions and trade-offs for agency staff. USFS staff much balance their limited time between fulfilling community stakeholder information requests and completing agency analysis and project implementation tasks. For one case study, the NFRC, negotiations of the boundary of knowledge are of particular concern. Perhaps this is owing to the contentious history between the NFRC and the USFS. Our research suggests that the USFS provides information and data to the community stakeholders earlier in, and more consistently throughout, the planning and decision-making processes than would be found in the traditional public involvement approach under NEPA requirements. Under these requirements, the agency is obligated to inform the public about proposed actions, receive comments about potential environmental issues associated with the proposed action, and provide opportunities for the public to review and comment on the draft environmental analysis document. However, the type and specificity of information and data sharing uncovered in our research is not common practice. In particular, community stakeholders are negotiating the USFS's boundaries of knowledge, both literally and figuratively reaching into the USFS to extract information not generally made available to or requested by community stakeholders.

Evolving web-based platforms for exchanging information between scientists, managers, and community stakeholders can comprise a practical strategy for overcoming challenges associated with boundaries of knowledge. For example, public participation geographic information systems allow all entities involved in a collaborative natural resource management initiative to upload, share, update, and verify information about resource conditions. New organizations are also emerging to bridge gaps in knowledge by facilitating the creation of, and curating, "boundary objects" developed by collaborative groups, such as monitoring data, maps, and strategy documents (Cheng et al., 2015). These organizations may be tied to university extension-type programs (Cheng et al., 2015) or may be virtual, such as NatureServe.

Negotiations of the boundaries of responsibility featured prominently in our two older case studies, with MOUs constituting critical boundary-defining mechanisms that delineate expected roles, responsibilities, behaviors, and outcomes for USFS personnel and the collaborative group. That MOUs are needed signifies a change in the roles and relationships between the USFS and the communities in which agency field offices are embedded (Frentz et al., 2000). An important issue for the USFS and community stakeholders to consider MOUs is the extent to which paper documents can translate to the actual behaviors and outcomes on the ground. MOUs may set boundary expectations of behavior, but the interaction between the local collaborative group and the local unit USFS staff does not

always follow a predictable pattern, with turbulence caused by frequent turnover in USFS staff and unexpected changes in the broader social, budgetary, political, and ecological environment. Because MOUs are entered into voluntarily and because of the lack of legal enforceability, adherence to behavioral expectations may be influenced by the degree of trust between the USFS and stakeholders. Future research that compares the MOU language with actual actions could provide a window into the usefulness of MOUs and the agreements they seek to define.

From a practical standpoint, there may be ways to increase the value of MOU's to both USFS officials and stakeholders. For example, documenting progress to meet goals in MOUs can be an input in USFS line officers' performance evaluations and rewards. Input from community stakeholder signatories on MOUs can also be used in performance evaluations, providing further incentive for both USFS line officers and stakeholders to allocate resources and organize actions around MOUs. From a policy perspective, competitive funding programs such as the Collaborative Forest Landscape Restoration Program (CFLRP) administered by the USFS can enhance commitment and accountability to MOUs. The CFLRP allocates USFS funds via a competitive selection process to support the implementation of collaboratively developed forest landscape restoration strategies. A condition of selection and renewal is for applicants to demonstrate authentic collaboration across a diversity of stakeholders. MOUs can be one such source of evidence.

Due to budget and personnel constraints across the USFS, collaboratively developed forest management projects face implementation challenges. In all three of our cases, the boundary of capacity was being negotiated, bringing human and financial resources to projects that would otherwise not be planned and implemented. The need for financial resources from sources external to the USFS highlights the financial challenges faced by the agency. Since 2000, the USFS has experienced a 36% increase in wildfire suppression costs, with funds coming out of budgets for non-fire functions, such as recreation management, forest stewardship, wildlife habitat improvement, and watershed restoration, among other functions (USDA, 2015b). These functions have also experienced a 39% decline in human resources in order to support increased wildfire suppression demand. Community collaborative groups appear to be stepping into this funding gap in order to implement agreed-upon forest restoration and stewardship projects. Indeed, evidence from the CFLRP demonstrates that, between 2010 and 2015, \$76.1 million from non-USFS entities was matched with approximately \$190 million in USFS appropriated funds (USDA, 2015a). Further research is needed on the extent to which these external funding contributions are

occurring beyond CFLRP projects, as this has the potential to significantly change the governance model of national forest management towards one of co-management. Such research-based evidence can inform further policy changes, such as expanding the scope of CFLRP, to induce collaborative forest stewardship initiatives on federal lands.

While our data suggests boundary negotiations and resultant organizational change was found within all three case studies, it is important to note that the results were based on a limited number of informants and the study did not include the entire population of those who might have experienced the same phenomenon. The reader is cautioned that the restriction of data collection to three case studies does not permit generalizations across the entire agency, but do highlight the organizational boundaries and the mechanisms by which they are negotiated and could be tested across a larger sample of USFS collaborative relationships in future studies. Because our study was limited to the western United States and a federal bureaucracy, an interesting line of inquiry would be to compare and contrast the organizational changes occurring in government agencies as collaborative efforts spread across the international stage.

## Conclusion

The external environments into which field offices of the public natural resource agencies are embedded can both facilitate and necessitate boundary negotiations that, in turn, become catalysts to organizational change. Although boundaries often appear static when viewed from a distance, boundaries are changeable and constantly negotiated entities. The malleability of an agency's boundaries is often determined by political, social, and economic factors in the external environment. As collaboration between public natural resource agencies and community stakeholders expands and evolves as a governance approach, it will pose challenges to public managers to adapt. Managers can proactively respond and adapt by recognizing the types of boundaries that can be affected when engaging in community collaboration, and actively engaging community stakeholders to negotiate these boundaries. In this way, public managers can maintain accountability to top-down policy direction while being responsive to changing community demands.

**Acknowledgements** We gratefully acknowledge that financial support for this research came from US Department of Agriculture's National Institute for Food and Agriculture funds administered by the Agricultural Experiment Station at Colorado State University (Project No. COL00666) and the Center for Collaborative Conservation at Colorado State University.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

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## Appendix A: interview guide

- (1) Background
  - (a) What is your position or role within your organization?
  - (b) Please describe your involvement with (group's name)
- (2) Organizational change
 

Please describe any changes or adaptations that you have observed being made at the USFS in response to (Group's name)'s collaborative efforts. These may be changes that have made directly by the organization or an individual.
- (3) Would the changes that you have describe come about if the USFS were a member of (Group's name)?
- (4) Barriers to change
  - (a) What factors do you think allowed for the changes you described to occur?
  - (b) Please describe factors that act as barriers to change.
- (5) Opportunities for change
 

What steps could the USFS take to facilitate change and/or incorporate ideas, plans, and programs developed by collaborative efforts in the future?
- (6) Are there others in your organization that you think it would be useful for me to speak with?
- (7) Are there documents or other materials that would be appropriate for me to review to supplement the information gathered in this interview or that would help me understand the background of the group better?

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