THESIS

POLICIES AND OTHER INSTITUTIONS TO SUPPORT CROSS-BOUNDARY FOREST MANAGEMENT: LESSONS FROM FOUR "SHARED STEWARDSHIP" PROJECTS IN THE WESTERN UNITED STATES

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ABSTRACT

POLICIES AND OTHER INSTITUTIONS TO SUPPORT CROSS-BOUNDARY FOREST MANAGEMENT: LESSONS FROM FOUR "SHARED STEWARDSHIP" PROJECTS IN THE WESTERN UNITED STATES

Land managers are increasingly seeking to increase the pace and scale of management actions by working across boundaries, but a key question is whether new approaches can be undertaken within the confines of existing institutions. Climate change, past forest management practices, and alterations in land use have led to increases in both the extent and severity of wildland fire in recent decades. Growing the pace and scale of land management activities to meet these challenges requires the cooperation of a diverse set of jurisdictions, organizations, and actors operating at various scales and with different capacities while balancing sometimes conflicting suites of objectives and public interests. In 2018 the United States Forest Service published "A Shared Stewardship Strategy" – an initiative focused on increasing the pace and scale of management actions and providing leadership direction for cross-boundary work, elevating as part of a longer-term trend the role of states and non-federal entities in managing forested ecosystems. Through qualitative inquiry, this thesis reports on four landscape-scale cross-boundary projects that meet the intent of Shared Stewardship. Chapter One introduces the study and reviews relevant literature related to institutions, policy implementation, cross-boundary work, and the context of forest management in the United States. Chapter Two, a research product written for a practitioner audience, discusses the involvement of partners and their roles in each project, the prioritization processes utilized by each project, and the key formal and informal factors that influenced each project. Chapter Three, a research product intended for a peer-reviewed journal, evaluates the institutions that facilitate and challenge cross-boundary work, and ways that actors attempted to overcome institutional challenges using a framework that integrates theories of policy implementation and historical

institutionalism. Chapter Four conveys overall conclusions and suggestions for further inquiry. Key findings were that guaranteed funding and central coordinators helped projects move forward, while internal USFS policies often negatively impacted a project's relative success. Project planners often innovated around institutional challenges through creative agreements and contracting methods. Insights from this research could help inform forest managers across the United States on ways to design and execute large-scale, cross-boundary work. This study also contributes to the growing body of literature on using policy implementation and institutional innovation lenses to investigate forest and other land management governance contexts. Further research should investigate the consequences of novel institutional changes, such as budget modernization and the impact of additional funding opportunities presented by the Infrastructure Investment and Jobs Act of 2021.

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CHAPTER 1 – INTRODUCTION

In 2018, the United States Forest Service (USFS) announced the Shared Stewardship Strategy to promote cross-boundary forest management and collaboration (USDA Forest Service 2018). Forest ecosystems frequently encompass multiple land ownerships, and this necessitates coordination across jurisdictions to affect ecological structures and processes such as biodiversity or wildland fire (Wurtzebach and Schultz 2016, Landres et al. 1998). To better facilitate forest restoration activities within and around national forest lands, the Shared Stewardship Strategy emphasized collaboration with other federal agencies, states, tribes, and other partners to prioritize, plan, and implement management activities. Three years after the strategy was issued, our team took the opportunity to draw lessons from projects being completed under the banner of "Shared Stewardship." Whether the terminology of Shared Stewardship continues, there will likely be an ongoing need, interest, and momentum associated with cross-boundary forest management (Kooistra et al. 2021, Kee et al. 2022). To date, relatively few studies have investigated both the partnerships (i.e., a joint working arrangement where partners are otherwise independent bodies cooperating to achieve a common goal (Dowling et al. 2004) and institutions (i.e., the structures, rules, laws, norms, and sociocultural processes that shape human actions (Thelen 1999) that support cross-boundary forest management projects that include work on National Forest System Lands (though see Charnley and Kelly 2017, Cyphers and Schultz 2019).

Historical practices of the USFS, in concert with the increasing effects of climate change and population expansion throughout the American West, contribute to forest and fuel conditions and attendant management needs, which transcend jurisdictional boundaries. During most of the 20th century, management practices focused almost exclusively on timber production and fire suppression (Clary 1986). These practices and the national culture of fire exclusion perpetuated by the USFS altered certain ecosystem characteristics – such as wildland fire regimes and forest structure – across millions of acres (Covington and Moore 1994, Oswalt et al. 2012, Pyne 2003, Keane et al. 2002). Throughout the United

States, these effects are most pronounced within systems that traditionally experienced frequent, low/mixed-severity fire regimes (Noss et al. 2006, Oswalt et al. 2012, Covington et al. 1994, Covington and Moore 1994). This, coupled with anthropogenic climate change, has increased forest acres consumed by high-severity wildland fires during the past half-century (Calkin et al. 2005, Miller et al. 2009, Westerling et al. 2016). Many of these affected landscapes did not traditionally experience such high-severity fires (Higuera et al. 2021, Noss et al. 2006, Oswalt et al. 2012). The continued population growth into areas with wildland vegetation (i.e., the wildland-urban interface or WUI) has increased the risk of negative outcomes to life and property, as well as increased the risk of ignition (Schoennagel et al. 2017, Schoennagel et al. 2009, Mietkiewicz et al. 2020, Liu et al. 2015). Together, these factors have led to a push to "restore" affected forest ecosystems to avoid adverse outcomes in forested landscapes (Hanberry et al. 2015, Hessburg et al. 2015, Covington 2000).

Despite recent scholarship, advocacy, and regulatory development, the USFS reports that it is not achieving the pace and scale of restoration necessary to impact structures and processes at an ecosystem level (North et al. 2012, USFS 2015). In the WUI, where risks to values are the greatest, the USFS does not have sufficient authority over forested landscapes to effectively manage ecosystem processes such as fire (USFS 2015). This reality requires the agency to work across boundaries with partners to achieve ecosystem-level outcomes (Wilkinson 1992). Institutional legacies of the 20th century that insulate the USFS from outside influence complicate partnerships, though these structures have started to change in the last few decades (Wilkinson 1992, Sousa and Klyza 2007, Bergemann et al. 2019, Abrams et al. 2020). In recent years, congressional and forest management leaders have put forth initiatives, policies, and directives encouraging both collaboration and cross-boundary work to increase the pace and scale of forest management actions and alter the existing forest management paradigm (Abrams et al. 2020, Bergemann et al. 2019, Cyphers and Schultz 2019, Bertone-Riggs et al. 2018, Schultz et al. 2019, USDA Forest Service 2018).

Prominent existing programs attempting to alter past forest management paradigms include the Collaborative Forest Landscape Restoration Program (CFLRP) of 2009 and the Joint Chiefs Landscape

Restoration Partnership (JCLRP) of 2014. The congressionally authorized CFLRP provides funding over 10 years to collaboratively planned projects. These projects must be at least 50,000 acres and occur primarily on USFS land. CFLRP funds can only cover 50% of planning and implementation costs on federal lands and cannot be used on lands outside of the National Forest System. In contrast, the JCLRP – originally an internally authorized interagency effort between the USFS and the NRCS before being permanently authorized by Congress in 2021– provides three-year funding to cross-boundary projects regardless of land ownership. Though projects under this program have more flexibility with regard to where funds can be spent, the strict three-year cycle provides less certainty for projects with longer-term implementation objectives (Cyphers and Schultz 2019). Both programs are most successful in facilitating collaborative work where there is past collaborative history, strong leadership, and adequate capacity (Schultz et al. 2018, Bergemann et al. 2019). Though the programs have demonstrated success at building collaborative capacity in project locations, capacity gaps remain that inhibit large-scale restoration across the nation's forested landscapes (Schultz et al. 2018).

The Good Neighbor Authority, permanently authorized by Congress in 2014, is also meant to shift past practices by helping to build partnerships and capacity. It functions by creating a "pass-through" mechanism the USFS can use to pay state agencies for work on federal land. Ideally, this helps close capacity gaps and establish collaborative relationships between the USFS and state agencies (Bertone-Riggs et al. 2018). The program successfully generated greater communication between the USFS and state agencies in certain areas but has relied upon the alignment of state and federal objectives to complete management work – a variable that is inconsistent across the country (Bertone-Riggs et al., 2018).

The Shared Stewardship Strategy of 2018, a next step in line with these former efforts, emphasizes the use of these programs, along with the importance of federal partnerships with states, tribes, and collaborative groups to identify priority areas for management and complete cross-boundary activities (USDA Forest Service 2018). Ideally, it is meant to leverage capacities, increase communication, and facilitate cross-boundary work. Because no aspect of the strategy is legally mandated, questions exist

about how it will facilitate large-scale cross-boundary management activities, what factors will affect the institutionalization of practices under the strategy, and how this will vary across different "Shared Stewardship" projects. Furthermore, there remains much to be learned about the institutions and partnerships used to facilitate the prioritization and implementation of cross-boundary projects. Nevertheless, the Shared Stewardship Strategy has the potential to increase restoration work by encouraging prioritization, planning, and implementation across lands characterized by mixed ownership and continuing an institutional shift towards more collaborative management of forested lands. In theory, its collaborative emphasis would facilitate large-scale restoration in areas that a single-ownership strategy would preclude and increase the overall efficiency of the restoration process (McIver and Becker 2021).

With the recent flurry of institutional changes, it has become necessary to investigate what institutions facilitate this type of work, what institutions challenge it, and how actors innovate around these challenges. To reiterate, institutions are the structures, rules, laws, norms, and sociocultural processes that shape human actions (Steelman 2010, Thelen 1999). Variations of top-down and bottom-up policy implementation theory are often harnessed as lenses to investigate how actors navigate thick institutional contexts during policy implementation and pursue institutional innovation. These theories share ideas with "structuralist" and "behavioralist" institutional thought in the field of institutional change (Hall and Taylor 1996, Ashford 1986, Matland 1995). To explain policy implementation, top-down theory emphasizes the role of directives from central authorities, incentives, laws, funding streams, and degree of alignment of local actor goals and objectives with those of high-level policymakers (Matland 1995, Sabatier and Mazmanian 1980, Van Meter and Van Horn 1975). Bottom-up perspectives emphasize local contextual conditions and field-level personnel's interactions with local actors as primary drivers of policy implementation. It focuses on actor agency and local unit conditions, including individual leadership, culture, and relationships with key political actors (Berman 1978, Matland 1995, DeLeon and DeLeon 2002).

Complicating this arena are more recent ideas of historical institutionalism – a section of "new institutionalism" adding a further dimension to the concepts elucidated above (Hall and Taylor 1996,

Orren and Skowronek 2004, Pierson 2004). Generally, historic institutionalism emphasizes that there is a path dependency to institutional change, and while there may be political support to create new institutional structures, support rarely materializes to completely remove old ones (Abers and Keck 2013). This results in the layering of institutions over time (Abers and Keck 2013, Pierson 2004). There is no widely accepted theory unifying the breadth of factors purported to govern institutional change though most scholars agree on the value of each of these perspectives when trying to understand how institutions shape implementation of policy directives and in turn change over time (Matland 1995, Hall and Taylor 1996.

Fortunately, a contextually relevant model designed by Moseley and Charnley (2014) exists to investigate integrates these theories to understand "microprocesses of institutional innovation." Their theoretical model incorporates policy implementation and historical institutionalism theories, with particular focus on bottom-up factors and actor agency in driving innovation. The Moseley and Charnley (2014) model integrates top-down factors and bottom-up variables that shape policy implementation, and emphasizes the role of social and biophysical context in shaping implementation. It then also adopts Berk and Galvan (2009)'s "creative syncretism" as a primary mechanism to explain how forest management institutions materialize at the field level. The idea of "creative syncretism," crafted to clarify how different actors interact with institutions over time, holds that actors in divergent contexts creatively combine and redefine existing institutions to meet emergent needs. (Berk and Galvan 2009). "Creative syncretism" is closely related to "institutional work," a term that describes how actors combine or create new institutions by interacting with them (Lawrence et al. 2011, Berk and Galvan 2009, Beunen et al. 2017, Beunen and Patterson 2019). Broadly, the field of institutionalism – and by extension "institutional work" – argues that past agency practices, cultures, and rules constrain and shape policy implementation but also interact with the creation and establishment of new institutions (Skowronek and Glassman 2007, Lawrence et al. 2011). In other words, when a new policy directive comes into play, where formal policy itself is an institution, actors can actively combine and shape existing institutions to fit their needs, particularly in thick institutional contexts common to governmental agencies; this in turn can lead to

institutional innovation in terms of how policies are put into practice in the field, and even lead to innovation that may become institutionalized over time at different levels of governance (Skowronek and Glassman 2007, Berk and Galvan 2009, Lawrence et al. 2011). Therefore, institutions are the product of both historical structures and multitudes of individual decisions due to contextual conditions and existing institutional frameworks (Berk and Galvan 2009). Paradigm shifts in United States forest management that require adjusting long-established institutions and, in some cases, creating entirely new ones provide fertile ground for actors to engage in "institutional work" (Timberlake et al. 2021).

While there has been a great deal of research conducted on institutional work, there has been relatively little research investigating policy implementation for cross-boundary forest restoration and management (though see Kelly and Charnley 2020 for a notable exception). Much of the work investigating cross-jurisdictional forest management is concerned with factors that influence effective cooperation and collaboration among actors, not the implementation of federal policy direction across landscapes (Kark et al. 2015, Bergmann and Bliss 2004, Schoenwald-Cox et al. 1992). Research concerning federal forests often uses policy implementation theory but tends to focus on single-jurisdiction efforts and how policy implementation manifests within that context (Schultz et al. 2019, Moseley and Charnley 2014, Steelman 2010, Butler and Koontz 2005). Some of this recent work has emphasized the importance of collaborative history, adequate capacity, and leadership as critical factors impacting successful implementation, particularly in light of policies that emphasize collaborative governance (Bergemann et al. 2019, Cyphers and Schultz 2019, Bertone-Riggs et al. 2018, McIntyre and Schultz 2020, Kooistra et al. 2021). Because policy implementation and institutional change theories share many similarities, this previous work sets the stage for more research on institutions to understand what facilitates cross-boundary work and what stands in its way.

I used a pragmatic research orientation and drew upon the policy implementation and institutional change literature to examine cross-boundary projects under the Shared Stewardship initiative. Pragmatic qualitative approaches emphasize actionable knowledge, recognize the interconnectedness between acting, experience, and knowing and view investigation as an experimental process in and of itself (Kelly

and Cordeiro 2020). This project had two primary objectives: (1) Understanding the nature of cross-boundary project partnerships, and (2) identify key institutional factors that shape the design and implementation of these projects. Our research team tried to meet these objectives by collecting perspectives from land managers and relevant stakeholders involved with specific cross-boundary projects we believed met the intent of Shared Stewardship. This research focused on four large-scale cross-boundary forest restoration projects – the Wildfire Adapted Missoula Project, the Scattered Lands Project, the Craggy Vegetation Management Project, and the Beaver River Improvement Project. We conducted semi-structured interviews with federal, state, local government, and non-governmental organization (NGO) employees, collaborative group members, and timber industry representatives. We identified interviewees by making initial contact with project line officers who provided a list of potential participants. We bolstered this list through a process of "snowball" sampling, where we asked interview participants for the names of others who could provide useful perspectives (Glesne 2011). In total, we conducted 44 interviews. Of those, 14 were associated with the Wildfire Adapted Missoula Project, 12 were associated with the Scattered Lands Project, 10 were associated with the Beaver River Improvement Project, and 8 were associated with the Craggy Vegetation Management Project. Interviews were conducted between June and December of 2021, lasting between 30-90 minutes. Interviews were confidentially conducted via phone, video call, or in person. We recorded these interviews with our interviewees consent. We then transcribed interviews via "Otter" – a third party software. Our team then checked them for errors, before systematically analyzing transcripts through qualitative coding in the software "Dedoose." This process involved categorizing segments of data into codes, developed emergently from our data as well as from our research questions. We collaboratively workshopped these codes to ensure their utility to our research objectives and to maintain their overall objectivity. The codes produced during this process helped organize our data and allowed for key themes to be identified for our final results.

This thesis contains two stand-alone yet connected chapters to present our research findings. Chapter 2 consists of a practitioner report for land management line officers and decision-makers from the USFS,

and any state or federal agencies who may find it relevant to assist them with the practice of cross-boundary land management. This report has been purposefully written with limited literature citations and academic jargon to be easily comprehensible for practitioners and those outside academic circles. This chapter explores the partnerships, prioritization processes, and formal and informal factors shaping cross-boundary work and offers suggestions from our interviewees for improving cross-boundary work. It includes perspectives on tactics and strategies, as well as recommendations concerning specific issues tied to cross-boundary work. Chapter 3 is an article intended for publication in the *Journal of Forestry*. This chapter utilizes a policy implementation and institutional innovation lens to identify key facilitative and challenging institutions for cross-boundary work and ways that actors innovated around institutional challenges. Findings were placed in the context of existing literature on institutional change to offer insights into potential ways that actors could manipulate current institutional structures. Chapter 4 summarizes key findings, discusses limitations of the research, and proposes future areas of exploration.

CHAPTER 2 – LARGE-SCALE CROSS-BOUNDARY HAZARDOUS FUELS REDUCTION: FOUR CASE STUDIES OF PROJECTS UNDER THE SHARED STEWARDSHIP STRATEGY

Executive Summary

Study Overview

Beginning in 2021, our team conducted four case studies to evaluate how field-level actors operationalized cross-boundary work to complete large-scale forest management projects under the banner of the United States Forest Service's (USFS) Shared Stewardship Strategy. Our goals were to identify key tactics used by different organizations and actors during prioritization, planning, and implementation of projects and ascertain the remaining formal and informal barriers to cross-boundary work. Our process involved determining the partners involved with each project, the prioritization processes utilized, and the institutional factors influencing each project's design and trajectory.

To meet our research objectives, our team conducted 44 semi-structured interviews throughout 2021 from four separate large-scale cross-boundary projects. We interviewed a mix of USFS, other federal agency, state agency, local government, and NGO personnel, as well as timber industry representatives and forest collaborative group members. All interviewees were either important players in a project and its development, or individuals with relevant perspectives concerning how a project compared with past efforts.

Findings

1. *Partners involved with the projects*

Project landscapes in three cases were primarily determined or recognized by the USFS before they engaged other partners. However, interviewees across the board made it clear that project landscapes and their associated needs were well known by stakeholders before the USFS engaged them. In all cases, various agencies, organizations, and stakeholders worked together, influencing the placement and priority of projects across these identified landscapes, although the exact makeup of these partners varied depending on the project's location and context. Many interviewees said project actors harnessed existing

collaborative forums and networks to facilitate prioritization discussions. Additionally, interviewees said the USFS collaborated during and after the National Environmental Policy Act (NEPA) process with partners to determine project parameters, sometimes including partners on NEPA teams or integrating additional land treatments, based on partner recommendations or priorities, into existing NEPA design parameters. Across all projects the Natural Resources Conservation Service (NRCS) was an essential player for implementing hazardous fuels reduction treatments on private lands through their Environmental Quality Incentives Program (EQIP), and they often worked with other county-level organizations to augment funding and outreach. Finally, during the implementation of projects, agencies and organizations frequently worked with private contractors to implement hazardous fuels treatments.

2. Prioritization Processes

Interviewees from all projects discussed collaborative processes used to prioritize projects where partners shared past, present, and future project locations and timetables to identify opportunities to expand treatments across boundaries. Some projects, for example, used modeling and mapping exercises to inform their prioritization processes, and some projects conducted community meetings to assess local landowner and stakeholder priorities while communicating general project objectives.

3. Formal and informal factors influencing project success

The Good Neighbor Authority (GNA), utilized by all projects included in our study, was frequently mentioned as one of the most essential tools the USFS has to complete cross-boundary work. Interviewees from two projects also discussed the importance of agreements signed under the "Wyden Authority" to work across boundaries, though they frequently paired these remarks with statements concerning the difficulty in fulfilling the bureaucratic requirements tied to this mechanism.

Interviewees agreed that regular appropriations were insufficient to sustain large-scale work and that projects depended on additional funding sources to scale up. In two cases, interviewees said that actors turned to the Joint Chiefs' Partnership to bolster funding levels, and in a third, interviewees indicated that project partners had recently applied to the program. Interviewees in two projects in Idaho and Utah said their work benefited from their state's respective Shared Stewardship programs, and that these programs

essentially provided funding assurances that brought more partners to the table. Additionally, interviewees from all projects commented that Steven's Hazardous Fuels Grants from the State and Private Forestry branch of the USFS were essential funding sources for private land and ingress/egress treatments.

Capacity was discussed as a major limiting factor to cross-boundary work. Interviewees said USFS grants & agreements capacity was insufficient to scale up management actions. Interviewees also frequently mentioned how yearly fire season disturbances stretched specialist capacity and slowed the pace of NEPA work. This was widely considered a significant challenge to efficient progress on complex actions such as cross-boundary work.

Participants from all projects routinely said leadership and unwavering commitment from specific individuals knitted collaborative efforts together and maintained momentum. Some interviewees discussed concerns with USFS budget modernization efforts, though they were unsure of the long-term impacts. Finally, interviewees across projects said that revenues from GNA timber sales were a significant incentive for states to collaborate with the USFS. They cautioned, however, that hazardous fuels treatments would need to consistently include merchantable volume moving forward or states would be less inclined to enter into GNA agreements with federal agencies.

Next steps and recommendations:

We synthesized suggestions for actors seeking to plan and execute cross-boundary forest management based on the perspectives and direct recommendations of interviewees. These include the following:

Interviewees said that existing capacity and funding available to individual management units through regular appropriations were not sufficient to drastically scale up forest management actions. More capacity and funding are needed at the federal and state levels to successfully implement large-scale cross-boundary work across the United States.

In the same vein, uncertain funding makes it difficult for the USFS to engage partners to plan and implement cross-boundary work. Without guaranteed funding, partners are less likely to work with the USFS out of fear that their own investments might go to waste.

Interviewees recommended increased time investments in relationship building with their local communities. Successful cross-boundary work often depends on past collaborative history, and current USFS institutions do not necessarily incentivize taking the time to build relationships with local organizational actors or community members.

Having a long-term coordinator for projects is key to their longevity and success. Cross-boundary work requires the coordinated efforts of a diverse set of actors with competing timeframes and organizational objectives. Coordinators serve as leaders for the project throughout its lifespan and function as a keystone to the project's cohesion over time. In some cases, the USFS was able to hire such a position, but in others where funding was not available for this purpose, USFS personnel took it on informally – adding to what they said was already a strenuous workload.

Information sharing is critical to strategically impacting resources with limited funding. Working cross-boundary with limited funding and capacity necessitates the calculated application of resources by individual organizations to achieve desired outcomes at a large scale. Finding ways to facilitate this information sharing will be crucial to the success of future cross-boundary efforts, particularly if no new funding or capacities are made available.

Introduction

In 2018, in response to calls for a new management paradigm, the U.S. Forest Service (USFS) announced the Shared Stewardship Strategy to encourage increases in the pace and scale of cross-boundary forest management activities (USDA Forest Service 2018). Key objectives included reducing wildfire hazard and enhancing forest resilience at large scales by partnering with states, tribes, and other federal and non-federal entities to collaboratively prioritize management actions and locations, leverage capacity, and coordinate work to maximize impact across boundaries. Specifically, the Strategy involved:

1. Working with states to share in the ownership of risks presented by fire through joint-prioritization and coordinated planning and action, with emphasis on the State Forest Action Plan (SFAP) revision process as a forum for these discussions;

2. Efficiently utilizing existing tools such as GNA and stewardship contracting to increase the pace and scale of forest management work;
3. Harnessing a suite of new scientific tools to identify strategic places to invest in forest management by modeling and mapping fire risk; and
4. Pursuing similar goals, such as engaging stakeholders, streamlining internal agency processes, and increasing the adoption of risk management principles in fire management.

The Strategy builds upon the foundation of previous efforts intended to accelerate forest management, facilitate work across jurisdictional boundaries, and prioritize funding to accomplish work scales effective enough to impact ecological outcomes. In the early years of the 21st century, the United States Congress and federal land management agencies began to focus more specifically on the fire as it relates to forest management through increased funding and strategic planning efforts (Schultz et al. 2019). Beginning in 2009, USDA leadership started emphasizing an "all lands" approach to forest management (USFS 2009), and Congress passed the Collaborative Forest Landscape Restoration Program which provides 10-year funding through a competitive application process to collaboratively designed projects on fire-adapted USFS lands (Schultz et al. 2012). The Joint Chiefs' Landscape Restoration Partnership (JCLRP), initiated in 2013, and permanently authorized by the Infrastructure Investment and Jobs Act of 2021[1], funds work both on USFS and private ground – though its monetary commitment lasts only three years (Cyphers and Schultz 2019). The GNA, permanently authorized nationwide in the 2014 Farm Bill, permits federal and state agencies to sign cooperative agreements to utilize state capacity to implement land management activities on federal land (Bertone-Riggs et al. 2018). The 2014 National Cohesive Wildfire Management Strategy provided leadership direction and laid out key objectives fire managers across jurisdictions should work toward, though it provided no additional funding opportunities or management authorities (WFEC 2014). The Shared Stewardship Strategy was a next step in the effort to promote cross-jurisdictional work. Nationally, it was largely a strategic document emphasizing joint prioritization, leveraging diverse capacities, and encouraging work across boundaries, begging the question of how this direction would be put into practice. As a result of the strategy, some states entered into unique

agreements with the USDA that created novel funding opportunities or positions that supported cross-boundary work (Kooistra et al. 2021). A key question was whether additional institutional work or change might be required to support cross-boundary work.

In 2019, Colorado State University entered into a challenge cost-share agreement with the USFS State and Private Forestry deputy area to execute independent research on the implementation and development of Shared Stewardship efforts. The principal investigator for this research is Dr. Courtney Schultz; Drs. Heidi Huber-Stearns at the University of Oregon and Jesse Abrams at the University of Georgia are co-principal investigators. Our research to date consists of three phases. Phase 1, completed in 2020, explored initial national and state-level expectations on the Strategy in western states with signed Shared Stewardship agreements (Kooistra et al. 2021). Phase 2 research, completed the following year, explored perspectives among state-level players in states lying east of the Rocky Mountains with signed agreements (Kee et al. 2022). Phase 3 (reported upon herein) zooms in to the field level and investigates the perspectives of actors involved with individual projects we believe meet the intent of Shared Stewardship. The objective of this phase is to understand how actors are operationalizing cross-boundary work to increase the pace and scale of management actions, with a focus on the western United States. Further phases will investigate the Strategy's maturation at the state level, as well as its influence on cross-boundary projects across the United States that were developed after the Strategy's publication. The following research objective and questions guided Phase 3 of our research:

Objective: *Understand the nature of cross-boundary, landscape-scale project partnerships, project identification, and project implementation within the United States Forest Service's Shared Stewardship Initiative.*

Questions:

1. *What partners are involved in identifying and prioritizing projects and why?*
2. *What prioritization processes are used to identify and plan them?*
3. *What collaborative forums, policies, funding tools, and other factors are in play?*

Approach

For this project, we used qualitative data collected from semi-structured interviews, a technique designed to facilitate a deeper understanding of human perceptions (Glesne 2011). All of our interviewees were involved with one of four hazardous fuels reduction projects—the Wildfire Adapted Missoula Project in western Montana (WAM), the Scattered Lands Project in northern Idaho (Scattered Lands), the Beaver River Restoration Project in south-central Utah (Beaver River), or the Craggy Vegetation Management Project in northern California (Craggy). Each of these projects contained cross-boundary components, where actors worked together to coordinate activities beyond their own agency's jurisdiction. Interview participants were identified by first contacting project line officers who provided a list of key players involved with that project thus far. Our initial list of participants for each project included land managers and officials from the USFS, NRCS, various state agencies, and local county and city governments. As data collection progressed, our sample grew to include additional members of government organizations as well as members of local non-governmental organizations (NGOs), timber industry representatives, and collaborative groups. Then, through a process of snowball sampling, whereby interviewees were asked if they had suggestions for other potential interviewees involved with the project, our team determined additional contacts to include in our study.

As a research team, we developed an interview guide located in APPENDIX B on page 69 that guided our line of inquiry for each participant. A total of 44 interviews (between 8 and 14 per project) took place between June and December of 2021. Of those interviewees, 18 were from federal agencies, 9 from state agencies, 7 from local governmental organizations, and 10 from NGOs, the timber industry, and collaborative groups. Each confidential interview lasted approximately 40-90 minutes and took place via phone call, video chat, or in-person. Interviews were recorded with permission from the participant and transcribed by the software "Otter".

Interviews were then qualitatively coded in a process through which segments of data were sorted into categories based on our research objectives and other major themes that emerged during the interview process. These codes were then analyzed individually by project to identify primary recurring themes for

each case, and again to determine relevant themes across cases. Through this process, we derived our key findings from the perceptions of our interview participants. Additionally, we selected quotes from our interviewees and included them throughout the report. These quotes were selected because they efficiently demonstrate key concepts through our participants' own words. Quotes were labelled with a project affiliation and a number (e.g., WAM 1) to provide context while maintaining confidentiality.

Results

Here, we present findings synthesized from all 44 interviews across the four projects. They are organized into three primary categories, including partner roles, prioritization processes, and institutional constraints and facilitators. Project-specific examples are included to help demonstrate the range of themes and factors, but these should not be considered exhaustive. More details on individual projects can be found in APPENDIX A of this report on page 55.

What partners were involved with prioritization, planning, and implementation?

Project landscapes in the WAM, Beaver River, and Craggy cases were primarily determined or recognized by the USFS before they engaged other partners. USFS personnel took the lead on advancing larger-than-usual projects and bringing partners on board to share resources and increase impact. In these three projects, the USFS managed the vast majority of the landscape, and interviewees said it made sense for the agency to assume a prominent leadership role.

Interviewees also made clear that project landscapes and their associated needs were well known by stakeholders before the USFS engaged them and said other partners had some say in the project's eventual boundaries. Interviewees said this general understanding and agreement about the landscapes in question set the stage for future agreement about project priorities. As one interviewee put it:

> *"We all have the same mission, we all want a resilient community. It doesn't matter if it's private land, state, land, federal land, whatever, we just want to be more resilient and defensible for wildfire. Everybody came together to move this thing forward and it accelerated. Because everybody had the same thought, the same goals and objectives, it was very successful moving forward from the beginning." (Scattered Lands 6)*

In all cases, various agencies, organizations, and stakeholders worked together, influencing the placement and priority of projects across identified landscapes. Those involved in these discussions varied

but often included other federal agencies, state agencies, local collaborative groups, and non-governmental organizations. The USFS in all cases played a leading role. For example, in the WAM Project, the Missoula Ranger District engaged with the Missoula County Fire Protection Association to determine general locational parameters and strategies for the project. For the Craggy Project, early collaboration between the USFS and Yreka Area Fire Safe Council on the area's Community Wildfire Protection Plan (CWPP) produced a basic blueprint of priority treatment areas that influenced USFS treatment locations. In the Beaver River Project, the USFS engaged local governments and prioritized treatments that abutted forested subdivisions or protected vulnerable hydropower infrastructure. For all projects, interviewees made clear that dialogues continued throughout the course of each project and were not limited to prioritization, although it was during prioritization that collaborative discussions had the greatest impact.

Existing collaborative forums and networks facilitated prioritization discussions. While the makeup of partners was heterogeneous across cases, it was clear that past collaborative relationships in project locations influenced the structure and eventual results of prioritization processes. The WAM, Craggy, and Beaver River Projects used relationships developed through fire response activities to discuss initial priorities. For example, the Beaver River Project's prioritization discussions grew from the Beaver Ranger District fuels specialists' working relationships with other stakeholders such as the local fire warden, city manager, and county commissioners. The Craggy Project benefited from the Klamath National Forest Supervisor's existing connections with CAL FIRE and the Yreka Area Fire Safe Council to inform prioritization decisions. The Scattered Lands Project also benefited from established inter-organizational relationships although actors for this project sought to forge a new collaborative paradigm under the banner of Shared Stewardship. As a result, the USFS and IDL deployed their new North Idaho Shared Stewardship coordinator to gather relevant players and discuss prioritization strategies.

Interviewees said the USFS collaborated during and after the NEPA process with partners to determine project parameters, sometimes including partners on NEPA teams or integrating additional land treatments into existing NEPA design parameters. With Scattered Lands, several interviewees said IDL

provided resource specialists to fill the USFS NEPA team, and state employees were heavily involved with environmental analyses completed for federal parcels in the project area. In the WAM project, the USFS utilized a BLM employee as their NEPA coordinator; the two agencies signed an inter-agency agreement to overcome USFS internal hiring barriers. Interviewees did not indicate that this altered their NEPA process. Some Scattered Lands interviewees discussed initial challenges teaching state employees USFS NEPA expectations. Interviewees associated with the Beaver River Project said the USFS worked with state agencies to fit treatments on non-federal land into parameters set by already completed NEPA analyses. These interviewees said that actors within the USFS and the state sought to create a homogeneous pattern of treatments across the landscape and worked to minimize discrepancies in prescriptions.

Across all projects, NRCS was an essential player for implementing hazardous fuels reduction treatments on private lands through their EQIP program, and they often worked with other county-level organizations to augment funding and outreach. Within the Scattered Lands Project, Bonner County's BonFire program provided an additional funding source beyond EQIP dollars to treat private lands and closely coordinated with NRCS to maximize the efficiency of these dollars across the project area. In both the WAM and Beaver River Projects, county governments played critical roles in assisting private landowners with hazardous fuels reduction through community outreach and coordination. The WAM Project also benefited from the United Way of Missoula County, an NGO that provided wildfire hazard mitigation and home hardening funding on small properties.

Agencies and organizations frequently worked with private contractors to implement hazardous fuels treatments. All projects used private contractors, but in both the Craggy and Beaver River Projects, interviewees spoke about a general lack of industrial capacity and its effect. One of the Craggy Project's initial challenges was a lack of potential funding to complete it. A proposed mill temporarily alleviated those concerns and allowed the project to move forward. One Beaver River interviewee said they believed the project had maximized its potential pace because it already utilized most of the available contractors, and this capacity constraint placed an upper ceiling on the project's scale. Importantly, interviewees from

both the Craggy and Beaver River Projects mentioned difficulties related to the capacity of their contractor base, discussing how the small profit margins associated with hazardous fuels reduction constrained industry and affected the treatment types they could contract out.

What specific prioritization processes were used?

Interviewees from all projects discussed collaborative processes used to prioritize projects where partners shared past, present, and future project locations and timetables to identify opportunities to expand treatments across boundaries. As one Scattered Lands Project interviewee said,

> *"So you know, the Forest Service, they're planning to treat every acre that needs treatment as part of the project, but how they're prioritizing it is by working really closely with our partners that represent private landowners, or private industry, and tying into some recently completed work, collectively identifying what those joints priorities are, and where we all can put resources as quickly as possible." (Scattered Lands 3)*

Beaver River Project interviewees said local district employees routinely coordinated meetings with potential partners to discuss management activities. The Scattered Lands Project compiled project locations through similar dialogues onto ArcGIS databases and used that information to strategize future actions. Most commonly, this took the form of more intuitive judgements relying primarily on the knowledge of local land managers and partners, though interviewees implied it was bolstered by fire modeling exercises. Organizations had their own individual objectives, which led to minor disagreements, but, differences were respected, according to interviewees. Interviewees connected to the WAM Project said that Missoula County elected officials disagreed with WAM's landscape focus. This group wished the USFS would focus more specifically on the "Home Ignition Zone" when discussing community protection and planning hazardous fuels reduction activities. Interviewees were quick to note, however, that these officials supported the project overall and that this disagreement was unlikely to impact the project's long-term trajectory and strategy due to the USFS's jurisdictional limitations.

Two projects used modeling and mapping exercises to inform their prioritization processes. For the WAM Project, interviewees discussed detailed hazard and vulnerability mapping produced by the Rocky Mountain Research Station's Fire Modeling Institute. Interviewees said that the mapping exercise provided a common language for partners and increased the credibility of the Missoula Ranger District in

the eyes of local communities allowing partners to effectively present a united front to a skeptical public. Craggy Project interviews also discussed how the Yreka Area Fire Safe Council CWPP modeling, and the Klamath National Forest's internal mapping exercises facilitated communication between partners and the public but highlighted it to a lesser degree. The Beaver River and Scattered Lands Projects also utilized hazard mapping; however, interviewees for these two projects said that this did not appear to vary from outside the normal scope of project planning and said these mapping exercises remained internal to the USFS.

In the WAM and Scattered Lands Projects, interviewees discussed efforts where partners conducted community meetings to assess local landowner and stakeholder priorities while communicating general project objectives. Project partners conducted community meetings where a cross-agency contingent presented about project objectives, local forest ecology, and financial assistance opportunities for interested landowners, and used these meetings to gauge overall community interest in the project. They said partners wanted to plan treatments in locations with the greatest appetite for reducing hazardous fuels, and project leaders believed the best way to reach community protection objectives was to coordinate public and private land treatments. Though interviewees on both the Beaver River and Craggy Projects discussed private landowner engagement, this outreach appeared less formal and did not influence prioritization decisions to the same extent.

What formal institutions and informal factors influenced these projects?

The following is a cross-section of relevant factors such as leadership, funding mechanisms, internal agency policies, and other influences that impacted the projects under investigation. They are organized by theme and ordered within each theme by general importance.

1. *Cross-Boundary Authorities*

The Good Neighbor Authority was frequently mentioned as one of the most essential tools the USFS has to complete these projects. In the words of one interviewee,

> *"I think the most important [tool] is the Good Neighbor Authority. I mean, that's really the one that allows us to do cross boundary work… it allows us to move money back and forth,*

so that [the state] can do contracting with our money. It allows us to actually work on each other's property." (Beaver River 2)

Some Scattered Lands interviewees discussed how USFS decision makers involved with the project opted to harness GNA to execute nearly all their planned timber sales and hazardous fuels reduction activities. Interviewees routinely cited the simplicity of state contracting processes compared to USFS contracting processes as a rationale for this decision. Some interviewees involved with the Craggy Project discussed the challenge of learning GNA processes but said that this was only a temporary issue. They pointed out that the Craggy Project included the first service contract timber sale through GNA in California. They said they were not surprised that there was an initial learning curve and added they were sure to use the authority again because of its capacity-expanding benefits. They cautioned, however, that this may not be a sustainable strategy because state agencies could only offer so much of their own limited capacity to do GNA work.

Interviewees of both the WAM and Craggy Projects discussed using agreements under the "Wyden Authority"[2] to work across boundaries. While interviewees said these agreements were beneficial, their comments often included remarks about how difficult the agreements were to execute due to bureaucratic requirements. For example, within the WAM Project, interviewees said that the USFS attempted to sign a Wyden agreement with The Nature Conservancy to meet a Joint Chiefs' Partnership implementation target. The time-intensive process could not be completed, however, before the target's deadline due to the complexity of the bureaucratic maze, according to interviewees. Craggy project interviewees offered that Wyden agreements were less appealing after CAL FIRE began to provide funding for private land treatments through California Climate Investment (CCI) grants. They said that CAL FIRE's less-complex requirements made it much more efficient to use these funds rather than funnel USFS funds to partners through the Wyden process.

2. Funding Sources

Interviewees agreed that regular appropriations were insufficient and that they depended on additional funding sources to scale up. One Craggy Project interviewee shared the following sentiment,

> *"The problem was that it was going to take a boatload of money to get done. There really was very minimal commercial component up there that we could rely on some product removal during the thinning operations that would help kind of pay for things. It was just one of those projects…They needed to make some other big investments, really significant investments to change the trajectory of the fuels situation." (Craggy 8)*

In some cases, interviewees felt that their project was well-positioned to receive these other funding sources, as with the Beaver River Project, where partners applied for Utah's Watershed Restoration Initiative (WRI) grants. Interviewees said they felt confident about future funding after WRI designated the entire watershed as a high priority for treatment, given the initiative's perceived longevity. In other cases, however, interviewees said they felt a funding cliff was looming, such as with the WAM Project, where some interviewees were unsure how the project would maintain its scale once its three years of Joint Chiefs' funding ran out. While they said the project had been awarded a substantial amount of money from the state of Montana the previous year, with a new governor, interviewees said they were unsure if similar future opportunities could be expected.

The Joint Chiefs' Partnership was a crucial source of funding for the Craggy and WAM Projects, and Scattered Lands Project partners also had recently applied to the program. WAM and Craggy Project interviewees both discussed how Joint Chiefs' awards not only increased the total amount of funds available for disbursement to private landowners through EQIP but also allowed the NRCS to target a specific landscape, making landowners more competitive for EQIP funding in that area. Interviewees in both projects discussed how this was crucial when prioritizing a specific geographic extent of private landowners for treatment. They said this was because local NRCS offices are otherwise discouraged from favoring one area over another. Joint Chiefs' applications, however, require a significant investment of time from both the NRCS and USFS; WAM interviewees said that capacity constraints with the NRCS prevented the completion of a second application.

Interviewees said that both the Beaver River and Scattered Lands Projects benefited from their state's respective Shared Stewardship programs. Some Beaver River Project interviewees believed that an influx in state and federal implementation funding from Utah's Shared Stewardship program was a significant reason for an increase in partners and expansion in project scale. While Idaho's program did not appear to

provide the same level of funding to the Scattered Lands Project, interviewees said state funding from this program still provided funds for some treatments and had facilitated the creation of the Shared Stewardship Coordinator position responsible for leading the project. Interviewees in both projects said they thought that these funding sources were key reasons for each project's success.

Steven's Hazardous Fuels Grants[3] from the State and Private Forestry branch of the USFS were essential funding sources for all projects' private land and ingress/egress treatments. These grants were either directly administered by state agencies or funneled through county-level organizations for ingress, egress, and hazardous fuels reduction on private lands. Because these funds are grants awarded by the federal government and then dispersed by state agencies, interviewees said yearly dollar amounts relied upon state-level employees and their grant application proficiency. Unlike EQIP funds, these grants did not have a landowner funding match or a forest management plan requirement. Interviewees said these grants were valuable funds to access, though they could only be used on projects within 1.5 miles of ongoing USFS work. However, one interviewee said by adding an appendix detailing an overarching large-scale project boundary to local CWPPs these funds could be used freely within the designated polygon.

3. Capacity

Interviewees said USFS grants & agreements capacity is insufficient to scale up management actions. Not only were these positions said to be understaffed to the point of interfering with operations, but they also were said to experience frequent turnover; several interviewees discussed how staff from other departments sometimes filled these roles to bolster capacity when needed. They cautioned this was not sustainable because employees from other agency departments could only partially fill these roles in addition to their assigned duties. As one interviewee put it,

> *"We've had high turnover in the grants and agreements arena and contracting officers. It's a hard place to keep filled. I'm sure it's not the most exciting job... So that's part of it. That's probably been one of the biggest headaches for us." (Beaver River 4)*

Interviewees frequently mentioned yearly fire season disturbances that stretched capacity and slowed the pace of NEPA work. Fire season was often described as an "all hands on deck" period for land

management agencies; during this time, fire management and suppression took precedence over other activities. Many agency employees involved with project NEPA processes also had fire qualifications. Interviewees said these employees were called upon to use these skills during the summer months and sent to incidents off-forest, stifling progress on environmental analyses until later in the year. The severity and duration of these workflow disturbances varied, and interviewees said they did not have ways to predict how much this might impact NEPA work, though they expected this problem to worsen as fire seasons increase in length.

4. Other Miscellaneous

Participants said leadership and unwavering commitment from specific individuals knitted collaborative efforts together and maintained momentum. For the WAM, Beaver River, and Craggy Projects, interviewees spoke about long-serving USFS employees who leveraged their existing relationships to patch together each project's network of partners. Within the more nascent Scattered Lands Project, the jointly funded USFS/IDL North Idaho Shared Stewardship coordinator was singled out by a majority of interviewees for their leadership and organization. Interviewees also described instances when members of state agencies, county governments, and local non-profit organizations provided crucial leadership and support. For example, interviewees connected to the Beaver River Project credited the local fire warden for their efforts coordinating private landowners. Within the WAM Project, interviewees discussed how the county wildfire preparedness coordinator organized Missoula County Fire Protection Association meetings and worked to align private land treatments with ongoing USFS projects. One interviewee provided a useful summation of this point when they said,

> *"The big take-homes...have been that personalities really matter. You know, things like shared stewardship can be meaningful. It's sort of encouraging agencies to collaborate. But if you don't have collaborative people or people who value collaboration in positions of leadership, it just doesn't happen." (WAM 9)*

Some interviewees discussed concerns with USFS budget modernization efforts. Interviewees said that the split of "implementation" funds from "salary" funds constricted the ways line officers could boost capacity. However, one interviewee said it simplified how money was deposited into unit coffers. In the

WAM Project, the advent of budget modernization prevented district leadership from hiring a NEPA coordinator with funds from the project's final year of Joint Chiefs'. It further strained already-limited contracting capacity by increasing the number of bureaucratic steps required to issue contracts in certain situations. However, all interviewees who discussed budget modernization said it always is a challenge to adjust to a new way of doing things and that they remained unsure of the long-term outcomes of the process.

Interviewees across projects said that revenues from GNA timber sales were a significant incentive for states to collaborate with the USFS. One WAM interviewee cautioned that USFS reliance on the authority for hazardous fuels reduction would likely reduce the motivation of a state to enter into those agreements,

> *"We've been doing more commercial timber sales with GNA, with some non-commercial, but primarily commercial it adds funds to the pool. We've been trying to get those funds built up. This project is on mostly non-commercial acres. And so that would be a drain on the GNA budget. It would be service work rather than revenue, and so that may constrain motivation for doing a lot of it because it's just going to cost money." (WAM 3)*

While it is true, they said, that hazardous fuels reduction is typically a shared goal, states have their own objectives they need to attend to, rather than simply serve as the USFS's workforce. Craggy Project interviewees said partners addressed this issue by crafting integrated resource service contracts to help fund the state where low timber values were not conducive to a merchantable timber sale.

Recommendations

Our findings from investigating the prioritization, planning, and implementation processes on these case-study cross-boundary projects reflected the complex dynamics between and within agencies, organizations, and local communities. Projects in states with additional funding and new positions created by Shared Stewardship appeared to be the most affected by the Strategy. Projects in states without new funding opportunities or boundary spanning positions, however, primarily benefited from the leadership direction and mission alignment the Strategy provided. Although each project varied, our interviewees revealed five key recommendations for facilitating increased cross-boundary work. Here we discuss these recommendations that should help natural resource managers execute large-scale cross-boundary work.

Not all of these are necessarily under the direct control of individual actors, but all emerged as important through our case studies.

Interviewees were clear that the existing capacity and funding available to individual management units through regular appropriations were not sufficient to drastically scale up forest management actions. All projects we considered relied on shared capacity through GNA, or additional funding sources such as Joint Chiefs' to reach their eventual scope. In the Scattered Lands and Beaver River Projects, interviewees routinely elucidated the importance of new positions and funding provided by their respective state's Shared Stewardship program. Additionally, fire season pulls away specialists from their project-specific tasks, hindering progress. Finding ways to minimize the inherent need to share capacity and chase additional funding will likely allow more large-scale cross-boundary projects to develop and succeed across a variety of contexts.

Providing funding guarantees would encourage partners to engage earlier in multi-year projects by eliminating much of the uncertainty that plagues current efforts. Uncertain funding makes it difficult to engage partners to plan and implement cross-boundary work. Funding awards and opportunities tend to exist only after considerable collaborative effort. Current institutional structures, however, tend to require well-developed proposals to apply for funding. For cross-boundary projects, this requires considerable time commitments from involved partners, and can therefore be a gamble for agencies and organizations with limited capacity. Crucially, partner involvement increased in all cases when funding was seen as likely.

Interviewees recommended increased time investments in relationship building with their local communities. The impact of past collaborative history is well documented in the literature concerning cross-boundary work; however, current institutional structures do not readily incentivize thorough engagement with local communities and stakeholders. Not only is community acceptance necessary to clear the NEPA process, but in large-scale cross-boundary work, private landowners often must execute management actions similar to those occurring on nearby public land for projects to meet their stated

objectives across landscapes. Creating incentives to engage often and over extended periods of time will likely increase the overall success of future cross-boundary work.

Having a long-term coordinator for projects is key to their longevity and success. Cross-boundary work requires the coordinated efforts of a diverse set of actors with competing timeframes and organizational objectives. Coordinator positions provide leadership and help keep projects on track to meet their objectives, organizing project tasks and strategically leveraging resources and relationships. At the time of our study, these positions were often informally filled by line officers or specialists in addition to their regular duties, however one project, Scattered Lands, benefited from a coordinator position specifically created through Idaho's Shared Stewardship program. Funding boundary-spanning positions like these would allow a coordinator to focus exclusively on project work and provide continuity for a project's duration.

Information sharing is critical to strategically impacting resources when limited funding constrains the amount of work possible. Working cross-boundary with limited funding and capacity necessitates the calculated application of resources by individual organizations to achieve desired outcomes at a large scale. Creating forums where information can be shared between agencies and organizations helps to ensure investments over a project's lifespan are indeed in "the right place at the right time." Efforts to create these types of forums in the projects under investigation revealed that significant hurdles remain to sharing information between different organizations, most notably with the NRCS and their PPI rules. Finding ways to share information fluidly between agencies and organizations is a key step in facilitating cross-boundary work.

Endnotes

1. The Infrastructure Investment and Jobs Act of 2021, (Pub. L. 117-58, No. 135 Stat. 1097 (2021)) invested 1.2 trillion dollars into a variety of federal programs aimed at repairing and improving the infrastructure and economic outlook of the United States.
2. The "Wyden Authority" (16 U.S.C. §§ 1011 & 1011a) allows the departments of Agriculture and Interior to enter into "cooperative agreements" with other federal agencies, tribal, state, and local

governments, and private and nonprofit entities/ landowners for the protection/restoration/enhancement of fish/ wildlife habitat “and other resources on public or private land” and for “the reduction of risk from natural disaster where public safety is threatened.”

3. Steven’s Hazardous Fuels Grants (Pub.L. 107-63, 115 STAT. 446) provide funding for hazardous fuels reduction treatments on “adjacent non-federal lands for the purpose of protecting communities when hazard reduction activities are planned on national forest lands”. These grants are administered by the State and Private Forestry Deputy arm of the USFS who funnel them to states, local government, cooperative, and non-profit organizations, or to small businesses (i.e. contractors) to complete hazardous fuels reduction work.

CHAPTER 3 – INSTITUTIONS THAT INFLUENCE CROSS-BOUNDARY FOREST MANAGEMENT: FOUR CASE STUDIES OF SHARED STEWARDSHIP ON THE GROUND

Introduction

Catastrophic fire is increasing across the United States, particularly in landscapes that did not historically experience such severe events (Higuera et al. 2021, Westerling et al. 2016, Noss et al. 2006, Oswalt et al. 2012). To address this trend, land management agencies must plan and implement management actions across landscapes at scales that affect ecosystem processes, commonly referred to as "landscape-scale" (Hanberry et al. 2015). In the wildland-urban interface (WUI), the United States Forest Service (USFS) – the largest forest land management entity in the United States (U.S.) – does not have sufficient authority over forested landscapes to effectively manage ecosystem processes such as fire (USDA Forest Service 2015). This reality necessitates that the agency works with partners to achieve ecosystem-level outcomes. Institutional legacies that insulate the USFS from outside influence complicate partnerships, though these structures have started to change in the last few decades (Wilkinson 1992, Sousa and Klyza 2007, Bergemann et al. 2019, Abrams et al. 2020). In recent years, congressional and forest management leaders have put forth initiatives, policies, and directives encouraging both collaboration and cross-boundary work to increase the pace and scale of forest management actions and alter the existing forest management paradigm, including the USDA's "A Shared Stewardship Strategy" of 2018 (Abrams et al. 2020, Bergemann et al. 2019, Cyphers and Schultz 2018, Bertone-Riggs et al. 2018, Schultz et al. 2019, USDA Forest Service 2018). With recent institutional changes, it has become necessary to investigate what institutions facilitate and challenge cross-boundary work, and how actors innovate around these challenges. We investigated these questions through four case studies of "Shared Stewardship" on the ground in the U.S. West.

Literature Review

Institutions are the structures, rules, laws, norms, and sociocultural processes that shape human actions (Steelman 2010, Thelen 1999). Scholars have studied institutional facilitators and challenges for

forest management in the United States, but this research tends to focus on single-jurisdictions and how institutional and policy implementation factors manifest within that context (Timberlake et al. 2021, Moseley and Charnley 2014, Steelman 2010, Butler and Koontz 2005). Collaborative governance scholarship emphasizes the importance of collaborative history, adequate capacity, and leadership as critical factors impacting the successful implementation of novel management institutions and policies when multiple organizations are involved (Steelman 2010, Bergemann et al. 2019, Cyphers and Schultz 2019, Bertone-Riggs et al. 2018, McIntyre and Schultz 2020). This work also highlights institutional challenges for working with multiple partners; these include insufficient funding, inadequate capacity, and complex and inflexible bureaucratic requirements (Steelman 2010). While research on collaborative governance offers glances into what influences cross-boundary management, it tends to focus on interpersonal and group dynamics and processes rather than the specific suite of formal and informal factors relevant to cross-boundary work (Davis et al. 2018, Emerson et al. 2012, Cheng and Mattor 2010, Ansell and Gash 2008, Cheng et al. 2003). As a result, the existing body of literature has set the stage for more research on cross-boundary forest management institutions and institutional change

Policy implementation theory and institutionalism theory are useful to understanding why certain practices are adopted and what eventual form they take. Policy implementation theories seek to understand how individual policies are implemented on the ground and why we see both consistency in implementation and variability. Both “top-down” and “bottom-up” factors explain why we see both consistency and variation in the shape of policy across contexts (Matland 1995). Top-down perspectives posit that successful implementation of new practices by actors in the field relies on clear directives from central authorities, minimal adjustments to those directives to account for local context, and close alignment of local actor's goals and objectives with those of high-level policymakers (Matland 1995, Sabatier and Mazmanian 1980, Van Meter and Van Horn 1975). Top-down factors explain why we see similar patterns across many divergent contexts (Matland 1995, Sabatier 1986). These factors include leadership direction, incentives, budget structures, and other aspects of agency-wide direction and performance assessment (Sabatier 1986, Steelman 2010).

Bottom-up factors include local contextual conditions and field-level personnel's interactions with institutional practices. Rather than shedding light on overall similarities, these factors are often helpful in explaining why we see variation across different situations and geographic areas (Matland 1995). Bottom-up theorists argue that the lower-level actors dictate what form policy implementation takes (DeLeon and DeLeon 2002, Berman 1978). They focus on individual agency and local unit conditions, including individual leadership, culture, and relationships with key political actors (Berman 1978, Matland 1995, DeLeon and DeLeon 2002). The most critical aspect of bottom-up theory is context and how local operators navigate within it.

Certain strains of institutionalism are also useful to help explain why practices are adopted, persist, or change and complement policy implementation theory by providing insight into why institutional structures remain stable or change over time (Orren and Skowronek 2004, Pierson 2004). Many scholars hold that there is a path dependency to institutions, and while there may be political support to create new institutional structures, support rarely materializes to completely remove old ones (Abers and Keck 2013). This results in the layering of institutions over time (Abers and Keck 2013, Pierson 2004). These institutional layers can assist or hinder solutions to emerging challenges, and can influence how, when, and where new policies or practices are institutionalized (Orren and Skowroneck 2004, Abers and Keck 2013).

There is no widely accepted unifying theory of policy implementation and institutional change, though most scholars agree that both theoretical angles help explain why certain practices are implemented and adopted over the long term (Hall et al. 1996, Matland 1995). Fortunately, a particularly relevant model designed by Moseley and Charnley (2014) exists to investigate forest management in the United States, and incorporates ideas from both policy implementation and historical institutionalism. Its direct orientation to the USFS captures the extent of structures and institutions at play better than competing theoretical models, and its inclusion of ideas concerning institutionalism make it particularly appropriate for our line of inquiry. In addition to traditional top-down and bottom-up variables, the model emphasizes three categories of local external factors, highlighting the importance of local biophysical, economic, and

socio-political conditions to understand the institutionalization of new practices within the context of U.S. forest management (Moseley and Charnley 2014).

The Mosely and Charnley (2014) model also incorporates Berk and Galvan (2009)'s "creative syncretism" to explain how forest management institutions materialize, vary, and shift at the field level. The idea of creative syncretism, crafted to clarify how different actors interact with institutions over time, holds that actors in divergent contexts adjust and adapt to influence institutional structures (Berk and Galvan 2009). Creative syncretism is similar to the concept of "institutional work," a term that describes how actors combine or create new institutions (Lawrence et al. 2011, Berk and Galvan 2009, Beunen et al. 2017, Beunen and Patterson 2019). Broadly, the field of institutionalism – and by extension "institutional work" – argues that past agency practices, cultures, and rules constrain and shape policy implementation, as well as the creation and establishment of new practices (Skowronek and Glassman 2007, Lawrence et al. 2011). Yet, actors can actively combine and shape institutions to fit their needs, particularly in thick institutional contexts where many layers of institutions can be mixed and matched, or even evaded (Skowronek and Glassman 2007, Berk and Galvan 2009, Lawrence et al. 2011). Therefore, institutions are the product of both historical structures and multitudes of individual decisions due to contextual conditions and existing institutional frameworks (Berk and Galvan 2009). In the present forest management context, land managers are increasingly working with external stakeholders to achieve their missions – a significant departure from institutional practices of the 20th century (Maier and Abrams 2018, Abrams et al. 2017). Paradigm shifts in United States forest management that require adjusting long-established institutions and, in some cases, creating entirely new ones provide fertile ground for actors to engage in "institutional work." (Timberlake et al. 2021). An institutional work perspective can offer a valuable lens for investigating innovation around institutional challenges as actors attempt to work with an array of partners to achieve ecosystem-level objectives through large-scale cross-boundary management actions (Beunen et al. 2017, Beunen and Patterson 2019). Further, it can be used to investigate new policies where actors engage in institutional work, as well as to identify where more formal institutional change may be necessary to support implementation, given that field-level

institutional work may not be sufficient or sustainable to promote longer-term institutional change (Moseley and Charnley 2014).

An opportunity for study presented itself in 2018 with the publication of the "Shared Stewardship Strategy" (USDA Forest Service 2018). The Strategy builds on recent efforts such as the Collaborative Forest Landscape Restoration Program (CFLRP), the Joint Chiefs Landscape Restoration Partnership (JCLRP), and the Good Neighbor Authority (GNA) which all incentivize collaboration and cross-boundary management (Bergemann et al. 2019, Cyphers and Schultz 2019). The Strategy emphasizes the use of these tools, along with the importance of federal partnerships with states, tribes, and collaborative groups to identify priority areas for management and complete cross-boundary activities, with a particular emphasis on hazardous fuels reduction and wildfire management (Kooistra et al. 2022, USDA Forest Service 2018). While there has been inquiry into these programs and their efficacy (see Charnley et al. 2020, Cyphers and Schultz 2019, and Bergemann et al. 2019), questions remain concerning what specific institutional factors most directly influence collaboratively designed cross-boundary projects with a wider scope than an individual CFLRP, JC, or GNA program. Past research has highlighted that capacity and funding-limited land managers often take an "all-of-the-above" mindset to authorities and available programs (Kooistra et al. 2022). Therefore, taking a research approach that investigates projects which actively mirror this mindset provides an opportunity to uncover key insights research focused on a single program might not capture.

Methods

This study examined cross-boundary forest management projects across the western United States. Here, we report on research concerning how the USFS worked with state agencies, local governments, NGOs, collaborative groups, industry partners, private landowners, and local stakeholders to prioritize, plan, and implement hazardous fuels reduction treatments on both USFS and non-USFS managed ground. We focused on projects that represented the cross-boundary principles of the USFS's Shared Stewardship Strategy, even though three of the four projects began several years before the strategy's publication.

We used qualitative methods and conducted four case studies to investigate large-scale cross-boundary forest management projects. The use of qualitative methods allowed us to learn the underpinnings of key actors' perceptions surrounding cross-boundary project prioritization, planning, and implementation. The recent publication of the Shared Stewardship Strategy (2018) encouraging the USFS to engage partners and work across boundaries, paired with other ongoing emphases to increase the pace and scale of active forest management, illuminated a need to identify factors facilitating, limiting, or inhibiting large scale cross-boundary projects and the ways that actors innovate around key challenges. Investigating four distinct cases provided the opportunity to analyze these factors and resulting practices under varying contextual conditions. We selected cases by communicating with USFS national, regional, forest, and district leadership to confirm that projects shared similar objectives, and met the intent of the Strategy. This ensured adequate comparison across cases and adherence to our research objectives (Yin 2003, Stake 1995). We selected the Wildfire Adapted Missoula Project (WAM Project), the Scattered Lands Project (Scattered Lands), the Craggy Vegetation Management Project (Craggy Project), and the Beaver River Improvement Project (Beaver River Project).

We collected data using confidential semi-structured interviews, employing a workshopped list of questions that allowed flexibility in the interview structure. This provided interviewees the opportunity to expand where their expertise and experience permitted. Our interview guide focused on partners and their roles within each project, prioritization processes used, collaborative communication and outreach strategies in play, project funding sources, specific cross-boundary and internal organizational policies, and perceptions on the overall influence of these factors. We contacted project line officers to determine an initial list of key project players to sample that could provide insight into the project. Then, we used "snowball" sampling, a method where interview participants give recommendations for additional interviewees, to bolster our participant cadre. Interviewees included USFS, other federal, state, and local government agency personnel, non-governmental organization employees, forest collaborative members, and industry partners. We contacted 54 people, and 44 accepted our interview request, for a total of 8-14 per project.

Data were collected during the summer and fall of 2021. Our interviews lasted 30-90 minutes and were conducted either in person, over the phone, or via video call. They were recorded with the consent of our participants. We transcribed these interviews verbatim using the third-party software "Otter", checked them for errors, and then uploaded cleaned versions to the qualitative data analysis program Dedoose. We then used systematic coding to organize and analyze our data. Codes were developed emergently and oriented toward our research questions. Codes were collaboratively built by our research team and evaluated to ensure consistency (Campbell et al. 2013). From the analysis facilitated by these codes, we produced the results and discussion found in the following sections. Additionally, we selected quotes from our interviewees and included them throughout the report. These quotes were selected because they efficiently demonstrate key concepts through our participants' own words. Quotes were labeled with a number and a general organizational association to provide context while maintaining confidentiality.

Results

Institutions Facilitating Cross-Boundary Work

Within projects that utilized jointly funded boundary-spanning coordinators, interviewees described the importance of these positions in facilitating communication and work across organizational boundaries. Interviewees within both the Scattered Lands and WAM Projects described how they employed boundary-spanning positions to coordinate across jurisdictions and communicate between organizations and the public. The Scattered Lands Project benefited from Shared Stewardship coordinator positions funded by the state of Idaho and the USFS to lead the project and its diverse contingent of stakeholders, while WAM utilized the Missoula County and USFS funded "Wildfire Preparedness Coordinator" to serve as a bridge between Missoula County, the public, and the Missoula Ranger District. Interviewees in these cases were unequivocal that these jointly funded, boundary-spanning positions were crucial to the success of their respective large-scale endeavors. These positions helped organize partners and facilitated effective communication and strategic planning throughout the life of each project.

Interviewees spoke highly of additional funding sources and said that these institutions allowed projects to attract additional partners, increase in size, and successfully fund hazardous fuels reduction on private lands. Two projects had been awarded Joint Chiefs Landscape Restoration Partnership (JCLRP) funds, and a third was in the process of applying during our interviews. This program, interviewees said, allowed project partners to fund hazardous fuels reduction on both federal and private lands. In the WAM Project, interviewees said it also provided funding for a project NEPA coordinator – a position that several interviewees said was crucial for successfully navigating their condition-based NEPA assessment. In the Beaver River and Scattered Lands Projects, interviewees discussed how additional funds from their state's respective Shared Stewardship programs positively impacted each project. When the Beaver River Project was awarded funding, interviewees said the influx of dollars led to a significant expansion in the number of partners and a rapid scaling up of hazardous fuels reduction implementation. Scattered Lands Project interviewees said that while their program did not provide much direct funding for project implementation, it did allow for the hiring of state-level Shared Stewardship positions that interviewees emphasized played important leadership and coordination roles.

Other state-specific funding sources were also considered key to increasing the scale of projects. Craggy Project interviewees emphasized the importance of California Climate Investment (CCI) Funds for completing project work after a planned mill fell through. Beaver River Project interviewees discussed the Utah Watershed Restoration Initiative and how funding from this source supplemented state-level Shared Stewardship funds. They also spoke positively of Utah Catastrophic Fire grants that funded fuels treatment on private properties.

Interviewees in all projects discussed federal monetary sources that allowed partners to fund hazardous fuels reduction on private lands – a pivotal supplement to work completed on federal and state grounds. Of most significant importance, according to interviewees, were Steven's Hazardous Fuels Grants and EQIP appropriations. Interviewees said these funds were critical to strategically reducing fuels across landscapes where private land intermixed with federal and state ownerships.

Interviewees of all stripes spoke highly of institutions that facilitated communication between partners. In all cases, project partners formed working groups that operated together to prioritize management actions and strategize capacity sharing. In some cases, interviewees said that existing collaborative institutions focused on fire response were harnessed to fill this need, and new institutions were created in others. For example, the WAM Project utilized the Missoula County Fire Protection Association to harbor discussions concerning large-scale hazardous fuels reduction in the area. By contrast, the working group for the Scattered Lands Project was formed to create a new collaborative paradigm between the USFS and the state of Idaho under the banner of Shared Stewardship.

Whether communicative institutions were well-established or novel, actors in all projects tapped into existing professional networks and relationships. The Beaver River Project offered the best example of this phenomenon; interviewees described how the USFS leveraged its long-standing connections with state agencies and local governments to discuss treatment locations, treatment plans, and engage private landowners when new opportunities arose to fund projects within the Beaver River watershed. As one interviewee put it,

> *"What has made us successful, I truly believe it's the partnerships…And I believe that relationships first create excellent projects later, and that you've got to build those relationships with your partners. I think that's something that we've done over the last 15 years. I think that's what's making it successful, it's our partners, we're all committed to doing what's right on the ground." (Beaver River 3)*

Interviewees in all projects emphasized that the long-standing professional relationships between organizations minimized the amount of learning between organizations that needed to occur and provided a cushion of trust when projects encountered challenges.

Across all projects, interviewees considered the Good Neighbor Authority to be an essential institutional tool for bridging capacity gaps. They spoke positively of its ability to leverage state resources and bypass complicated federal contracting requirements. One Beaver River Project interviewee said that it allowed the USFS and the state of Utah to bridge each other's primary gaps:

> *"So [the state] is actually implementing the contract, we gave them the dollars, we helped them write up the prescription, and they're actually implementing it for us, which is a huge boost to us. Definitely lightens our load and helps them out because they didn't have the*

funds to get everything done that they wanted on their side. But hey, you help us we help you." (Beaver River 1)

This general sentiment held across projects, to the extent that within the Scattered Lands Project line officers opted to execute all planned federal timber sales through GNA.

Institutional Challenges to Cross-Boundary work

People said regular appropriations were insufficient to scale up projects compared to past endeavors. Several interviewees associated with the WAM Project expressed concern that momentum might stall if a replacement for expiring Joint Chiefs' funding could not be found. As one succinctly stated,

"Jumping from one grant to the other is not going to suffice. We don't want to over-promise or over-commit, and then under-deliver on everything that we have going on." (WAM 10)

The Craggy Project experienced similar uncertainty when a planned mill fell through. One interviewee stated that it "was better to be lucky rather than good" (CVM 8) when they discussed how CCI opportunities arose around the same time and provided funding opportunities. Across the board, interviewees were clear that their projects were unlikely to have progressed very far without additional funding opportunities.

Many interviewees cited intra-organizational policies, particularly within the USFS, as key institutional challenges. Misaligned budgetary timelines between agencies were often a frustrating challenge that hindered cross-boundary work. Beyond difficulties communicating deadlines between agencies, these misaligned timelines resulted in misaligned capacity, which interviewees said increased the number of missed opportunities. A key example given by WAM Project interviewees was how the USFS and the Natural Resources Conservation Service (NRCS) could not reapply for JCLRP funding because the NRCS did not have the available capacity to complete a second application within the required time frame.

Federal agency bureaucratic requirements were also frequently discussed as an institutional challenge. Interviewees both within and outside the USFS spoke of how the agency's complex contracting rules took significant time to navigate, emphasizing that the severity of this issue exacerbated the USFS's lack of internal capacity to implement large-scale projects – threatening to severely limit the pace and scale of

project implementation. Interviewees within the USFS also discussed how the agency's hiring processes made it difficult to bolster capacity when necessary. One USFS line officer discussed how hiring complexities forced them to prioritize filling one position over another, even though adequate funding was available, and each position was deemed critical to the project's long-term objectives. Requirements tied to the Wyden Authority were discussed by several interviewees as a challenge, though most interviewees saw the authority as an important mechanism for increasing the impact the USFS could have across boundaries. Interviewees said the complex process necessary to execute Wyden agreements made them imperfect instruments. They emphasized that Wyden could tie up already limited internal agency capacity and, as a result, required careful strategy to use the authority efficiently. Many Scattered Lands Project interviewees mentioned NRCS personal and private information rules as a critical challenge related to prioritization efforts within their landscape. These rules prevented the NRCS from sharing information identifying private parcels treated using EQIP, posing a problem to land managers seeking to strategically link treatments between different ownerships.

Interviewees in multiple projects cited capacity constraints as a persistent institutional problem. Some said that USFS contracting and grants and agreements departments were limited in capacity and that the combination of this limitation and the general lack of an in-house implementation workforce would prevent the USFS from drastically increasing the pace and scale of management activities. Furthermore, in some instances, interviewees discussed how limited local industrial capacity formed an upper ceiling of hazardous fuels reduction work that could be potentially completed. Interviewees closely tied to the forest products industry expressed concern that unless industrial capacity could expand, large-scale restoration activities would be consistently challenged, especially if the USFS continued to implement the majority of its projects through contractors.

Key Institutional Innovations

Interviewees for each project described instances of field-level actor agency to overcome specific policies and rules they perceived to be challenges. This agency came from individual leaders, organizations, and organizational partnerships. Within the Beaver River Project, interviewees said that the

Fishlake National Forest opted to create open-ended IDIQ contracts to quickly allocate regional end-of-year funding when it became available, allowing the agency to maximize the use of limited contractor capacity. USFS interviewees said these contracts were indispensable tools that allowed the Fishlake National Forest to handle annual uncertainty and minimize unspent dollars. Additionally, interviewees credited the decision by the Beaver Ranger District to complete large-scale NEPA analyses before funding was necessarily available for project implementation as a masterstroke of preparation. They specifically applauded long-serving district employees with this foresight and said the number of "shovel-ready" projects made it highly attractive to receive funding when initiatives such as Utah's Shared Stewardship program came into existence. Within the Craggy Project, interviewees described how the lack of merchantable value within the project's footprint led the agency to develop IRR contracts that could be paired with GNA agreements, creating the first GNA timber sale in California. Interviewees said that these contracts permitted the state of California to avoid revenue loss on GNA projects within the area and incentivized collaboration between the state and the federal government. One interviewee summed it as such,

> *"In this instance, they were acting as if they were the Forest Service. They solicited bids for our timber contracts and did everything that we would have done. So it was the first-ever GNA that had timber product removal in this region, and so it's a bit different than typical GNA [in California]." (Craggy 1)*

WAM Project interviewees highlighted an interagency agreement signed between the USFS and the BLM that allowed the USFS to circumvent both hiring and intra-agency detailing rules. This agreement permitted a BLM employee to serve in the role of NEPA coordinator for the WAM Project for one year – three times as long as a traditional 120-day USFS detail. Interviewees said that this was critical to managing disruption associated with positional turnover and allowed the USFS to maintain NEPA process momentum during the first year of the COVID-19 pandemic.

In many instances, project partners employed innovative methods for sharing capacity and collaborating to meet shared objectives. In all projects, interviewees described how GNA agreements were used to bolster the implementation capacity of the USFS. These were frequently cited as the most

important recent innovation to increase the pace and scale of forest management work. Beyond GNA, most projects developed specific innovations that helped maximize limited capacity. Scattered Lands Project interviewees described how the Idaho Department of Lands entered into an agreement with the USFS that allowed state specialists to help complete NEPA analyses for federal parcels. Though interviewees said there was an educational curve for state personnel to learn federal NEPA requirements, the collaboration allowed the NEPA process to move efficiently without forcing the USFS to sacrifice progress on other endeavors. For the Craggy Project, interviewees talked about how the Northern California Resource Center and National Fish and Wildlife Foundation chased down funding opportunities. They emphasized that this partnership expanded the capacity to pursue funding and that this partnerships' success allowed the project to increase the amount of funding available to private landowners beyond what was offered by Joint Chiefs' EQIP funds.

Interviewees with the WAM and Scattered Lands Projects said project partners designed public engagement methods in response to the perceived attitudes of local stakeholders. Within the WAM Project footprint, interviewees said project actors anticipated hesitancy within the local community after conflict embroiled a previous fuels reduction project. The USFS, the National Forest Foundation, and the Missoula County Office of Emergency Management collaborated to develop multiple targeted community meetings called "learning labs" in high-priority treatment areas to address this hesitancy. Interviewees relayed that they believed these meetings effectively engaged what they referred to as the "silent middle" – individuals that generally supported hazardous fuels reduction efforts but did not necessarily voice their support or involve themselves with forest management issues. In the words of one interviewee,

> *"Some of the public outreach stuff for the Forest Service can be box-checking, like, 'Hey, we gotta have some public meetings, let's just get this over with. Let's kind of do it minimal, check the box and then get on to our project.' I think the public feels that at those meetings it is box checking, and that nobody wants to be there. And I think the Missoula Ranger District did a great job at really giving an earnest effort at public engagement in a way where the community felt respected." (WAM 9)*

In addition, members of the Missoula Ranger District created an ArcGIS story map to communicate project objectives further and reach out to those unable to attend the "learning labs" in person. Scattered

Lands Project partners also anticipated hesitancy concerning their efforts, but they attributed this to local patterns of distrust toward government organizations rather than any specific past action. To address this distrust, project partners hosted targeted community meetings in areas where significant fuels reduction on private land was anticipated to be necessary and sought to present a well-coordinated and united front that demonstrated expertise and collaborative spirit. After community meetings, project partners sent bi-fold postcards to specific areas offering financial assistance for fuels reduction and ways to connect with local land management professionals. Scattered Lands interviewees said that these tactics produced interest in private land hazardous fuels reduction opportunities that exceeded even their most optimistic estimates.

Interviewees from two projects spoke of innovative ways the USFS and its partners opted to generate and share data to enhance communication between agencies, organizations, and the public. The Missoula Ranger District worked with the Fire Modeling Institute of the Rocky Mountain Research Station to produce fine-grain vulnerability and hazard mapping within the WAM polygon. The resulting product, interviewees claimed, helped project partners confidently engage community members in high-priority watersheds and communicate risk with nuance. Scattered Lands interviewees detailed the development of shared ArcGIS project databases that allowed land managers to share planned and completed projects and permitted actors to prioritize management actions across the landscape and determine the best treatments and funding sources for private landowners. As one interviewee stated,

> *"I think the whole database thing is big. For us to be able to communicate with each other that we did outreach to these people so that we're not always pancaking on top of each other. The landowner's not going to distinguish or decipher what each program is. They just need help, and so I hope that this database will help us point them in the best direction." (Scattered Lands 4)*

Given the highly intermixed land ownership pattern within the project area, interviewees remarked that such databases were critical to the efficient use of limited funds and capacity and for accurate progress tracking over the life of the project.

Discussion

Key Findings

Our study found instances of institutions that facilitated cross-boundary work, institutions that challenged cross-boundary work, and innovations that actors employed to overcome institutional challenges and find creative solutions. Facilitating institutions included boundary-spanning leadership positions, additional funding sources beyond yearly appropriations, funding sources targeting private lands, capacity sharing mechanisms such as GNA, and communicative forums to share information across boundaries. Challenging institutions included typical, past funding levels, intra-organizational policies for both federal and non-federal entities, and insufficient capacity levels. Actors and organizations innovated to overcome these challenges, though their innovations were frequently constrained by other institutional issues indicating further institutional work at higher levels is needed. This begs the question of whether Shared Stewardship in practice can be successful without more substantive institutional change.

Indeed, our findings suggest that "Shared Stewardship" has the greatest capacity to result in institutional change within states that used the strategy as an opportunity to actively create new institutions. In Idaho, this included the new state-level coordinator positions funded by both the USFS and the state that function as boundary-spanning leaders. In Utah, this included the creation of new funding opportunities provided jointly by the state and the USFS. In other states, such as Montana and California, without new positions or funding opportunities, it is less clear whether the strategy will result in more permanent alterations to forest management institutions. At the very least it seems likely that Shared Stewardship will retain more influence in states like Idaho and Utah than in states without new formal institutions such as Montana and California.

Our research also uncovered ample evidence for the role of actor agency and the importance of institutional work. Interviewees in multiple projects described instances where actors innovatively wielded existing tools or applied them in novel contexts to overcome specific institutional challenges. These findings align with the idea that actors can engage in institutional work, and more specifically, support Berk and Galvan (2009)'s assertion that actors "combine" institutions in ways that may result in

new institutions. Additionally, we found evidence that biophysical factors such as past conditions and forest type, economic conditions such as cost of treatment and industrial capacity, and social and political conditions such as leadership and local community support or opposition directly influenced the path new institutional development appeared to follow. These findings support the validity of Mosely and Charnley (2014)'s model of institutional change in the context of United States forest management. The relative importance of these factors was not equal in each case, however, and some questions remain regarding their respective influence on cross-boundary forest management.

Implications for Practice and Policy

Nearly all our interviewees said they perceived relationships between land managers, or between land managers and the public, to be key boundary-spanning relationships that they often credited for the success of their efforts. This finding aligns with earlier work in the collaborative governance and cross-boundary forest policy fields that demonstrated the importance of past collaborative history (Schultz et al. 2018; Bergemann et al. 2019). From a practical perspective, it suggests that a critical first step for line officers seeking to work cross-boundary at a large scale is to invest in the practice of working with potential partners on much smaller projects before scaling up. This allows partners to learn one another's processes and timelines while the stakes are relatively low and the projects are comparatively simple.

Interviewees across all projects said they believed field-level positions that facilitated communication across boundaries and led project partners forward played key leadership roles and were responsible for keeping the projects on track. This finding aligns with past results in the collaborative governance, and cross-boundary management literature which highlight the importance of boundary-spanning positions and organizations (Huber-Stearns et al. 2019, Davis et al. 2021). This amount of agreement strongly implies the necessity of institutionalizing boundary-spanning positions to coordinate work when attempting to increase the scale of cross-boundary projects.

Our research also found that certain federal bureaucratic requirements posed challenges to actors attempting to work cross-boundary. Interviewees described difficulties with USFS contracting processes, federal hiring processes, and NRCS rules around sharing private information. None of these findings are

necessarily novel (see Butler et al. 2015, Santo et al. 2021, Cyphers and Schultz 2018). However, our findings did illustrate workarounds and limitations to those workarounds. Across all projects, our interviewee's near-unanimous praise of GNA and how it can be used to bypass USFS contracting requirements indicate its utility as an alternative to traditional internal processes. While GNA did offer a solution to this issue, it was a temporary fix, as actors said it relied entirely on the limited capacity of state agencies, and as such the re-evaluation of USFS contracting processes will likely be needed to eliminate the root problem. Additionally, the WAM Project's interagency agreement between the USFS and BLM demonstrated the potential of specialized inter-organizational arrangements to bypass convoluted federal hiring processes – though their solution was only temporary. In this instance, the USFS's usage of a BLM employee as their project NEPA coordinator provided an example of how past collaborative history can set the stage for innovative collaborations. Scattered Lands interviewees were cautiously optimistic that the project's bi-fold return mailers – with their option to voluntarily provide identifying information – might be enough to overcome the information sharing restrictions of the NRCS and allow project partners to acquire a comprehensive picture of past and planned hazardous fuels reduction projects on private lands. Regardless of this solution, interviewees maintained that this restriction was a significant institutional hurdle that required considerable time investment from already capacity-limited agencies to surmount.

Overall, the value of GNA when attempting to increase the pace and scale of management actions on USFS land is hard to overstate. Interviewees on all projects, and from almost all organizational affiliations, repeatedly extolled the benefits of the authority. These included both the ability to bypass contracting requirements and to facilitate capacity sharing. While this institution is still relatively new compared to other administrative practices, early investigation of its usage yielded similar findings (Abrams 2019, Abrams et al. 2017, Bertone-Riggs et al. 2018). However, positive assessments by our interviewees were not without caution. Some interviewees believed that unless the USFS found a way to structure agreements as net positive revenue streams for state agencies, the motivation to engage with the Forest Service on projects outside of shared priority areas would be limited. The Craggy Project's

solution of developing IRR contracts offers a potential option, but further investigation is needed to ascertain whether such an arrangement is feasible outside of that project's particular context.

Our findings also indicate that guaranteed funding commitments are strong motivators for cross-boundary engagement. Because many land management or natural resource-oriented organizations are capacity-limited, line officers often must act strategically, and concrete assurances of funding create more attractive opportunities to invest time and personnel. Past research on the JCLRP and CFLRP programs demonstrated how increases in promised funding can attract greater participation (Bergemann et al. 2019, Cyphers and Schultz 2019, McIntyre and Schultz 2020). Our study not only continues this trend, but the Craggy and Beaver River Projects both offer examples of how increased funding commitments can drastically alter the trajectory of cross-boundary participation. In each of these cases, influxes of funding attracted new partners and provided motivation to engage with the USFS on large-scale cross-boundary work. Institutionalizing ways to commit funding early in project development will likely improve overall partner engagement and allow for more comprehensive landscape-scale approaches.

Research Reflections

Our research suggested several directions for future study. First, while our work hinted at possible permanent institutional change, our two-year timeframe of investigation did not permit us to track new practices over a long enough period to confidently assert whether institutions had been permanently altered or only temporarily adjusted. While Shared Stewardship created new funding opportunities and positions in certain states, and individual projects employed novel solutions to institutional challenges, the long term prospect of these practices cannot be ascertained without further research. Next, our work focused on successful projects, and a potential limitation of our study may be that it did not investigate less successful projects, or projects that failed outright. While our research did not uncover fatal institutional factors in the projects we considered, that does not mean these factors do not exist. Furthermore, our study focused on projects with specific suites of objectives centered on wildfire risk mitigation with particular emphasis on community protection. Additionally, future research should focus on more wildfire risk mitigation oriented cross-boundary projects to compare to our results, and on

projects with more diverse objectives given the wide breadth of values present across different ecosystems (Baker et al. 2014). Though our research touched on the subject of cross-boundary data sharing, more research should also be conducted on institutional challenges related to this practice, and on data sharing's overall impact to cross-boundary work. The utility of data-sharing across boundaries is well recognized by academics and land managers alike; however, the practice is still limited (Kooistra et al. 2022). Ascertaining whether this is a result of institutional rules, capacity constraints, funding gaps, or a combination of these and other factors will be likely be key to increase the amount of data-sharing, and to further institutionalizing cross-boundary work.

The current administrative context also offers avenues for future investigation. At the time of our interviews, the USFS was undergoing budget modernization. This process involves reorganizing the accounting structure for the agency, and when we talked with those familiar with the changes to the agency's budgetary framework, they expressed uncertainty regarding future impacts. While interviewees expressed concern that it might negate methods line officers had developed in the past to bolster capacity, they did say they believed it would provide a more transparent accounting of agency resource expenditure. Given the nascency of this new institutional practice, it is difficult to discern potential impacts, and further research will be needed to determine long-term consequences. Near the completion of our data collection efforts, Congress passed the Infrastructure Investment and Jobs Act of 2021[1] which invests billions of dollars into wildfire management activities. The extent of investment in programs that support cross-boundary work is currently unclear. It will be critical to continue following cross-boundary work throughout the country to determine if this investment addresses the funding and capacity issues highlighted by our study.

Endnotes

1. The Infrastructure Investment and Jobs Act of 2021, Pub. L. 117-58, No. 135 Stat. 1097 (2021).

CHAPTER 4 – CONCLUSION

This thesis explored the nature of large-scale cross-boundary projects under the USFS's Shared Stewardship Strategy, focusing on four case studies in the western United States. Its objectives were twofold: (1) understand the nature of partnerships, landscape identification, prioritization, and project implementation for these endeavors, and (2) understand the institutional factors that shape the design and implementation of this type of work. Through interviews with federal and state land managers, local government representatives, members of non-governmental organizations, timber industry partners, and collaborative group participants, our study addressed these objectives across our cases.

Overall findings for the first objective were discussed in Chapter 2, the practitioner report written for the USFS and other natural resource agencies and organizations. Our study found that local collaborative history strongly influenced the makeup of project partners, that project landscapes and their needs tended to be well known by partners before USFS engagement, that NRCS played a crucial role in engaging private landowners, and that organizations relied heavily on private contractor capacity to implement fuels reduction work across the board. We found that collaborative prioritization discussions influenced treatment placement and that detailed mapping exercises and jointly hosted community meetings were often used to communicate project objectives to relevant stakeholders. Finally, we uncovered formal and informal factors influencing each project. The Good Neighbor Authority (GNA) was critical for sharing capacity and viewed as an invaluable tool in each project. Supplementary funding sources, such as the Joint Chiefs Landscape Restoration Partnership, state-specific Shared Stewardship programs, and Steven's Hazardous Fuels Grants, were crucial resources that permitted projects to scale up. USFS grants & agreements capacity remains a limiting factor to large projects. Leadership from key field-level actors was critical to holding collaborative efforts together and maintaining project momentum. Boundary-spanning leaders were considered particularly important. In addition to these findings, interviewees offered several recommendations for improving the cross-boundary work. They suggested raising baseline appropriated funding levels to incentivize partner engagement, and suggested increasing field-

level time investments in community relationship-building to create collaborative networks and necessary social consent. Considering the complexities inherent to large-scale cross-boundary work, line officers should find ways to establish specific project coordinators that can tie efforts together, manage the immense diversity of partner needs and timelines, and facilitate information-sharing between organizations.

In Chapter 3, our peer-reviewed article intended for the *Journal of Forestry*, we utilized a policy implementation and institutional innovation lens to understand institutions that facilitated and challenged cross-boundary work and uncover how actors innovated around institutional challenges. Using this lens allowed us to focus on factors that influenced examples of large-scale cross-boundary work. Though less specific than many other research efforts to date, taking such a broad approach nonetheless allowed us to holistically examine individual cases, rather than narrow slivers of each. This research opens further discussion concerning institutions associated with cross-boundary forest management. It is critical for those seeking to implement large-scale cross-boundary work to understand the importance of committed boundary-spanning leadership positions and communicative forums, the utility of capacity-sharing mechanisms, and the current necessity for additional funding sources. They must also recognize the challenges posed by internal agency processes and capacity gaps. Successful land managers will likely need to adopt innovative practices like creative inter-organizational agreements, tailored outreach campaigns, and novel data sharing forums to overcome internal organizational constraints, build social capital, and communicate across boundaries. This study parallels other work concerning cross-boundary activities and adds to the growing field of institutional work literature specifically focused on wildland fire and forest management. This research can serve to inform line officers and other land managers on the institutions surrounding large-scale cross-boundary forest management and offer suggestions for navigating the complex landscape of policies, norms, and practices currently associated with this type of work. It contributes to the policy implementation and institutionalism literature focused on natural resource management, and it adds to the growing body of knowledge specifically concerning shifts in

United States forest management structures – highlighting pivotal institutions that will likely exert considerable influence on cross-boundary efforts moving forward.

This study offers valuable perspectives from key land management partners and stakeholders involved with large-scale cross-boundary work under Shared Stewardship; however, limitations to the study exist. This study only focused on four large-scale projects widely considered successful examples of cross-boundary work. Institutional factors truly fatal to cross-boundary projects may lurk, but the focus on successful efforts likely barred this research from such a discovery. Furthermore, this research investigated projects with specific objectives tied to wildfire risk mitigation and community protection – the initial thrust of Shared Stewardship – and projects with other resource objectives are likely to have unique institutional factors that influence their success. Finally, our study was limited to a brief investigatory window which prohibited us from evaluating whether the innovations employed by actors in each project resulted in long-term institutional change. While our results are promising, they cannot answer that question conclusively.

More research should be conducted on institutional challenges related to cross-boundary data sharing and on the practice's overall impact on cross-boundary work – given that interview questions were not designed to probe this specific topic. Ascertaining how institutional factors impact this practice will likely be vital to increasing data sharing's prevalence in land management and, by extension, institutionalizing activities such as cross-boundary work that rely on it. Additionally, significant institutional shifts were developing as data collection for this study concluded. Both USFS budget modernization and the Infrastructure Investments and Jobs Act of 2021 have the potential to alter the forest management administrative landscape, though the extent of their impact remains unclear. Researching the effect of these institutional changes will be necessary to understand whether they alleviate or exacerbate issues described in this thesis.

Overall, our work can inform national, regional, state, and field-level land managers and assist them in developing large-scale cross-boundary work. For members of the USFS, it can suggest a suite of general best practices that set the stage for cross-boundary success, and it highlights likely challenges the agency

can expect to encounter along the way. For states and other partners, it can shine a light on internal agency challenges, capacity limitations, and potential collaborative opportunities when engaging with the USFS and other federal agencies. For those engaged in cross-boundary efforts not directly linked to the USFS or forest management, it can offer useful insights for basic cooperative strategies to overcome challenges that frustrate multi-jurisdictional efforts. Perhaps the greatest lesson our findings emphasize is the complexity of cross-boundary work. If land managers seek to increase the pace and scale of forest management across the United States by cooperatively working across boundaries, understanding the factors that influence this work will be critical to their success.

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APPENDIX A – INDIVIDUAL CASE SUMMARIES

Wildfire Adapted Missoula Project

What is the Wildfire Adapted Missoula Project?

Wildfire Adapted Missoula (WAM) is a 455,787-acre project encircling the city of Missoula, Montana, on the Missoula Ranger District (MRD) of the Lolo National Forest. Key partners include the MRD, Bureau of Land Management's Missoula Field Office (BLM), the Montana Department of Natural Resources and Conservation (DNRC), Missoula County, the Rocky Mountain Research Station (RMRS), NRCS, The Nature Conservancy, The United Way of Missoula County, The National Forest Foundation (NFF), and the Lolo Restoration Committee collaborative group (LRC). The landscape contains dry mixed-conifer forests of western larch, Douglas-fir, and ponderosa pine. The USFS manages most of the area's landscape, but there are sections of land managed by the BLM, DNRC, TNC, and private landowners.

How was this landscape identified and what were the project prioritization processes?

The MRD initially conceived of a landscape-scale project in the mid-2010s after the publication of the 2014 National Cohesive Wildland Fire Management Strategy. District leadership engaged with the Missoula County Fire Protection Association (MCFPA) to discuss what a hazardous fuels reduction project around Missoula would entail and determine the project's footprint.

The MRD completed hazard mapping for the WAM area, breaking it into over 30 "focal treatment areas" (FTAs) with associated hazard ratings. Four FTAs emerged with the highest hazard: the Blue Mountain area, the Rattlesnake Creek drainage, the Grant Creek drainage, and the Schwartz Creek drainage. The MRD then met with RMRS's Fire Modeling Institute to add additional layers to the hazard mapping and produce a more refined modeling summary for each of these FTAs.

The MRD, NFF, and Missoula County then put on a series of community meetings to gauge support for a landscape-scale project. This group sought to determine which of the four high hazard FTAs had the most robust community appetite for: 1) home hardening activities and hazardous fuels treatments on

private lands, and 2) hazardous fuels treatments on nearby public lands. Through this process, Blue Mountain community members appeared to show the greatest enthusiasm for treatment on private and public land, and the MRD opted to prioritize treatment in this location. During our interviews, the project was commonly referred to as a landscape-scale multi-decadal "vision." As such, most interviewees gave examples where the MRD actively collaborated with partners on hazardous fuels reduction and other forest restoration activities outside of FTA priority areas.

How did partners collaborate, and how were private landowners involved?

Due to the complexity of the USFS's permanent employee hiring process, interviewees said the MRD could not hire a long-term coordinator for the WAM NEPA project. After utilizing one 120-day detailer for the role, the MRD entered into an agreement with the BLM that allowed a BLM employee to serve as WAM's NEPA coordinator for one year. Most interviewees familiar with this arrangement praised its effectiveness in preventing the typical disruption turnover causes. They acknowledged, however, the solution was not permanent and that the BLM employee eventually returned to their previous post.

Through identification and prioritization discussions that took place during MCFPA meetings, members of the MCFPA decided that a Wildfire Preparedness Coordinator (WPC) position was necessary to coordinate activities between land managers and private landowners, that this position should be housed in the county government, and that Missoula County, the DNRC, and the MRD should jointly fund the position. At the time of our interviews, this position coordinated and organized fuels treatments and home hardening activities on private land near USFS projects and helped coordinate MCFPA meetings.

Interviewees said that MRD leadership saw a need to engage the Missoula community after pushback from a previous fuels reduction project. The MRD partnered with the National Forest Foundation and the WPC to facilitate eleven community meetings within high hazard FTAs. These included presentations from local land managers and forestry professionals, site visits, and opportunities for open dialogue regarding the project. Additionally, the MRD created a public-facing ArcGIS story map detailing project objectives and local forest ecology that community members could access instead of attending meetings.

Interviewees said that these tools were instrumental in building support for the project and saw value in this type of outreach continuing for the duration of the WAM Project.

What cross-boundary authorities, mechanisms, and associated funding streams were in play?

Multiple interviewees said that GNA was an important tool that allowed the USFS and BLM to streamline their contracting process when working with the DNRC. In one instance, the use of GNA facilitated a tri-partner project consisting of land managed by the USFS and BLM, with implementation entirely carried out by the DNRC. One interviewee expressed concern that a lack of timber sales associated with hazardous fuels reduction could constrain the state's motivation to engage with the federal government on future GNA arrangements because projects without merchantable volume used DNRC's limited capacity without boosting the organization's revenue stream.

Interviewees said that the Joint Chiefs' Partnership was an essential source of funding for the project. It allowed the MRD to detail in a project manager during the NEPA analysis, provided an influx of funding for private land treatments, and presented an opportunity to fund bio-mass removal through "bio-char" production. However, interviewees noted that this funding, awarded in F.Y. 2019, was set to expire after FY 2021. They said that the USFS and the NRCS did not complete a second application due to NRCS capacity constraints that prevented them from meeting the application deadline.

Other inter-organizational agreements provided project partners opportunities to collaborate. Inter-agency agreements allowed the MRD to fund the WPC coordinator with the DNRC and Missoula County and permitted a BLM employee to serve as a NEPA coordinator. Interviewees also said that Wyden Authority agreements had been necessary, but challenging, to implement work adjacent to USFS land and to secure access over private roads.

What were key challenges?

Many interviewees discussed funding and capacity challenges specific to the USFS. Interviewees familiar with the USFS budgetary process discussed how budget modernization impacted the final year of Joint Chiefs' funding. They said that the separation of salary and implementation funds prohibited the MRD from bringing on additional detailers or seasonal workers to implement project work. Most

interviewees also expressed uncertainty concerning future funding and whether the project would continue long-term. They highlighted the expiration of Joint Chiefs' financing as a primary concern due to the insufficiency of regular budgetary allocations to complete landscape-scale work. Interviewees also said the number of bureaucratic steps in the USFS contracting, and grants and agreements processes, along with limited staff capacity in those areas, constrained cross-boundary work and their ability to find innovative solutions.

Many interviewees also discussed how budgetary timelines made it difficult for organizations to work cross-boundary. They said that mismatched deadlines shrunk windows in which funding could be contracted out to partners and that learning other partners' deadlines was an often-overlooked collaboration step.

Most funding for private land treatments came from NRCS's Joint Chiefs' EQIP allocation, a cost-share program operated by the United Way of Missoula County, or Steven's Hazardous Fuels Grants stemming from State and Private Forestry deputy area of the USFS. Multiple interviewees discussed challenges funding treatments under five acres in size. Some interviewees also mentioned the lack of funding for home hardening activities such as flammable roof and deck replacement and said this funding gap left the community vulnerable.

Scattered Lands Project

What is the Scattered Lands Project?

The Scattered Lands Project is a 173,942-acre project in southwest Bonner County, Idaho on the Sandpoint Ranger District of the Idaho Panhandle National Forests. The project is primarily oriented towards hazardous fuels reduction to protect communities and natural resources. Key partners include the USFS, the Idaho Department of Lands (IDL), NRCS, and Bonner County. The land ownership pattern is intermixed with small parcels of USFS, and IDL-managed land scattered amongst industrial and non-industrial private acreages. The landscape consists of high-density lodgepole pine alongside ponderosa pine, western white pine, Douglas-fir, and western larch.

How was this landscape identified and what were the project prioritization processes?

Interviewees said the project originated after the USFS and State of Idaho identified the North Idaho Shared Stewardship Priority area in 2019. Once this landscape was identified, a state-level Shared Stewardship coordinator began to engage field-level officials of the USFS, IDL, NRCS, and other organizations to determine where collaborative efforts could maximize impact across boundaries within this priority area. Partners sought to identify areas where treatment already existed and where USFS NEPA analysis was completed. This working group of local partners settled on southwestern Bonner County. Not only did this focused landscape meet the essential criteria, but, due to its complex land ownership pattern, interviewees said it fit the spirit of the Shared Stewardship Strategy and was well-suited to be one of Idaho's flagship Shared Stewardship projects.

To prioritize projects within the landscape, partners held community meetings in the western part of the landscape to communicate the intent of the Scattered Lands Project. These meetings began building connections among people in places where communities were historically distrustful of government organizations. Then, IDL sent out mailings providing information on funding opportunities for hazardous fuels reduction on private lands. They said this outreach campaign began on the west end of the project landscape because the area's 2020 Hunter 2 fire appeared to galvanize local landowners. Also, the terrain is relatively level; therefore, focusing treatments methodically west to east would take advantage of the prevailing winds and reduce fire risk across the landscape more efficiently.

How do partners collaborate, and how are private landowners involved?

Most interviewees credited the leadership from the North Idaho Shared Stewardship Coordinator for much of the success the project had experienced so far. They said this individual generally facilitated communication among partners and was responsible for organizing the local prioritization workgroup and community meetings. This position, jointly funded by the USFS and IDL, was created to organize and lead Shared Stewardship projects.

Interviewees spoke positively about how project partners communicated with one another, with private landowners, and with community stakeholders. Several highlighted new public-facing ArcGIS databases

that showed planned and completed treatments and helped individual agencies determine where to treat next. Interviewees said, however, that NRCS's personal and private information rules prohibited the agency from sharing treatment locations they funded. As a result, these databases were incomplete, and interviewees said actors were in the process of finding workarounds. Many interviewees also said holding community meetings as a united group of partners built trust between agencies and private landowners and boosted acceptance of fuels reduction projects. Most interviewees said they believed the targeted mailings that followed community meetings were highly effective. These prepaid bi-fold postcards sent by IDL provided a brief overview of the Scattered Lands Project. They included a return mailer where landowners could choose to initiate contact with IDL service foresters or request more information. Also attached was a QR survey code link where landowners could optionally provide information about themselves – a feature interviewees said was included in an attempt to overcome NRCS personal and private information rules.

Interviewees also said that NRCS and Bonner County's BonFire program coordinated actions to maximize scale and efficiency. Both entities fund private landowner treatments. Interviewees said that the NRCS and BonFire program managers routinely communicated from the time of initial landowner contact through treatment completion to help landowners find the best funding source for their needs, and combine projects were possible. Interviewees said it was common to refer applicants between programs after government-funded service foresters inspected their property and determined which program was a better fit.

What cross-boundary authorities, mechanisms, and associated funding streams are in play?

Interviewees from both the state and the USFS spoke about the importance of GNA. They said seed money provided by the timber industry funded early GNA efforts and helped build some of the relationships that have been crucial to Scattered Lands early on. Interviewees said that IDL would implement all of the projects on USFS land within the Scattered Lands area through GNA, and interviewees from both the USFS and IDL said it allowed partners to bridge capacity gaps to increase the pace and extent of management actions.

Interviewees said that the state had authorized reoccurring funding to implement Shared Stewardship projects, but these funds could not support salaries. As a result, partners used this money for implementation costs on private lands, though interviewees said the USFS and NRCS were able to use some of these funds to help write a JCLRP application that was under review at the time of our interviews.

Two primary sources funded fuels treatments on private land, and interviewees said these sources played a much more significant role than state Shared Stewardship allocations. The first was NRCS's EQIP program, a 50/50 federally funded cost-share program for agricultural improvement (including fuels reduction and forest stand treatments) on parcels of land at least 5 acres in size. EQIP, people said, is a better fit for larger properties where contractors can remove merchantable timber that then can serve to meet the required landowner match. The second is the Bonner County BonFire program, which provides funding to treat private lands without a cost-share requirement, and is better suited to treat subdivisions with small lots where fuel breaks are the primary treatment type. At the time of our interviews, EQIP funding for Scattered Lands stemmed from regular congressional appropriations, while BonFire dollars came from Steven's Hazardous Fuels Grants provided by the State and Private Forestry deputy area of the USFS and which must be spent near ongoing USFS projects. One interviewee said that Bonner County was working to incorporate the Scattered Lands Project area into its Community Wildfire Protection Plan to meet this requirement. Interviewees noted that given the large amount of private land within the landscape, having both programs was crucial to the project's ability to treat lands across a larger, mixed-ownership landscape.

What where the key challenges?

Multiple interviewees said NRCS personal and private information sharing rules complicated the development of ArcGIS databases used to inform prioritization decisions. They said these rules made it difficult to determine where private land treatments had already occurred and where partners could tie in treatments to maximize impact across boundaries. Multiple interviewees expressed optimism that mailers

sent by IDL would help alleviate this challenge by providing an avenue for landowners to volunteer information for the database.

Many interviewees discussed challenges related to inter-agency communication. Some non-USFS interviewees described difficulties learning the USFS's policies, practices, and timetables. They said that this factor was particularly challenging during the NEPA process for Scattered Lands. Additionally, some interviewees felt that there was not enough communication between agencies and felt "left in the dark" about what other agencies and organizations were doing. Interviewees tended to stress that as relationships strengthened between partners, these challenges were likely to lessen.

Craggy Vegetation Management Project

What is the Craggy Vegetation Management Project?

The Craggy Vegetation Management Project is a 29,500-acre hazardous fuels reduction treatment project to the west of Yreka, California on the Salmon/Scott River Ranger District of the Klamath National Forest. Key partners included the USFS, CAL FIRE, Yreka Area Fire Safe Council, the National Fish and Wildlife Foundation (NFWF), NRCS, the Shasta Resource Conservation District, and the Northern California Resource Center. The project polygon is entirely within the 1955 Haystack Fire scar, which was planted post-fire with ponderosa pine, and is primarily USFS land with adjacent parcels of private property.

How was the landscape identified, and what were the project's prioritization processes?

Interviewees said that the Klamath National Forest in the early 2010s, through a modeling and budget prioritization exercise, identified this area as a high priority for hazardous fuels reduction. While litigation surrounding management actions on the Klamath is not uncommon, nearly all stakeholders agreed that hazardous fuels reduction should be a priority in the Craggy area, especially given the "non-natural" characteristics of the forest. The low value of the timber and lack of available funds, however, precluded a plan from taking shape until a timber company decided to build a pallet mill in the area. Though the mill fell through almost immediately due to factors outside the project area, the prospect of the mill led the USFS to complete NEPA analyses for the Craggy area. The state of California began to fund CCI grants

in the late 2010s that could be used for hazardous fuels reduction, effectively bridging the funding shortage that occurred when the mill fell through. Because the USFS had gone through their NEPA process, interviewees said that the project was a strong candidate for CCI funding.

To prioritize and plan treatments within the identified landscape, the USFS modeled fire behavior across the Craggy area and overlaid it with values-at-risk to determine areas of highest vulnerability. The Yreka Area Fire Safe Council, a state-funded organization, also completed modeling that informed project design with the assistance of the USFS and a private data science firm. Interviewees also said that the USFS frequently communicated with CAL FIRE regarding each of their protection responsibilities and capacities to further determine treatment locations.

How did partners collaborate, and how were private landowners involved?

Interviewees said the Yreka CWPP of 2016 brought the USFS and members of the Yreka Area Fire Safe Council together to discuss hazardous fuels treatments in the Craggy area. The Fire Safe Council took point on private landowner outreach and developed a local campaign with print and audio media to advertise wildfire risk mitigation strategies and connect property owners to funding sources.

Interviewees said that new funding opportunities had increased the number of willing partners in recent years. At the outset, anticipated timber receipts led the USFS to begin the NEPA process and work with stakeholders such as the Yreka Area Fire Safe Council. Later, new funding opportunities such as California's CCI grants in 2018 and then a Joint Chiefs' award in 2019 brought in CAL FIRE and NRCS, respectively. Interviewees in government agencies said that the prospect of funding was a powerful motivator that had been lacking in the past.

Multiple interviewees credited the leadership of the Klamath National Forest for stitching together the network of partners involved with Craggy. Early on, interviewees said that the former Forest Supervisor actively prioritized building relationships with CAL FIRE and Yreka Area Fire Safe Council members. Now that this individual had moved on from their position, interviewees praised the forest's fire ecologist for coordinating partners and maintaining relationships. Some interviewees said they were concerned that future turnover in these central positions would become a challenge.

What cross-boundary authorities, mechanisms, and associated funding streams were in play?

Interviewees discussed the importance of GNA for Craggy and how it allowed the USFS to utilize state capacity to complete treatments; some noted as a result there had been a direct positive effect on the local community. Interviewees said it allowed experience and capacity to be built locally by employing community members through the state. Employees of the Shasta Resource Conservation District helped write integrated resource restoration contracts that fit with GNA due to the potential of negative value timber sales; interviewees said these were likely the first of their kind in California.

Funding under the Joint Chiefs' Partnership, received in 2019, provided significant funding for hazardous fuels treatment on federal and private land. One interviewee said that it was an ideal pot of money to utilize for projects in the WUI that abut USFS land because it provides additional EQIP funding separate from regular allocations, allowing the NRCS to increase treatments within a priority area rather than force landowners to compete against applications submitted outside of the Craggy footprint.

Interviewees said that Steven's Hazardous Fuels Grants have been significant for treating private lands and ingress and egress routes throughout the Craggy footprint and that the Northern California Resource Center had been primarily responsible for procuring these funds. Interviewees went on to say that these grants are preferable to many landowners over EQIP dollars due to the lack of a landowner funding match requirement.

Interviewees said that California's Climate Investment (CCI) grants provided a second chance to fund projects tied to Craggy after the mill in Yreka closed. The completed NEPA work allowed the area to be competitive for these grants, though interviewees described some growing pains learning how to apply for them effectively, but they believed that partners had developed successful strategies. Interviewees said that NFWF was the primary organization pursuing this type of funding, but the USFS frequently assisted the organization due to NFWF's own capacity constraints.

What were the key challenges?

Interviewees described multiple capacity constraints that impacted the project. First, the local NRCS did not employ a forester until mid-2020, which made it challenging to complete forest plans for private

landowners who wanted EQIP funding. Second, the NEPA planning process slowed significantly during fire season due to USFS personnel leaving on fire assignments. Finally, interviewees said that while GNA has helped increase the scale of the project, CAL FIRE also has capacity limitations that may negatively impact future GNA efforts. They emphasized that GNA alone is not a viable strategy for further increasing the pace and scale of management actions without first bolstering the capacity of CAL FIRE.

Many interviewees commented that the lack of consistent funding commitments made it difficult to plan projects at a landscape scale. When projects do not have funding attached, they said, potential partners are less motivated to join with the USFS in the planning and implementation of projects.

While interviewees said they believed having a core group of partners throughout the latter half of the process helped foster success, some said they still felt in the dark about the effort's progression. Specifically, some partners said they felt siloed from the USFS and would like to increase communication about where projects were planned and when they were likely to be implemented.

Beaver River Improvement Project

What is the Beaver River Watershed Improvement Project?

The Beaver River Watershed Improvement Project is a 60,000-acre hazardous fuels reduction project located east of Beaver, Utah on the Beaver Ranger District (BRD) of the Fishlake National Forest. Key partners initially included the BRD, Utah Division of Forestry, Fire, and State Lands, Beaver City, and Beaver County. The project recently grew to include the State Institutional Trust Lands Administration (SITLA), Rocky Mountain Power, the Elk Meadows Special Service District, the Utah Department of Transportation, NRCS, local homeowner's associations, and the Eagle Point Ski Resort. The USFS manages most of the watershed, with a small number of state and private inholdings within the project footprint. The forest type ranges from low-elevation ponderosa pine and juniper to subalpine spruce-fir.

How was the landscape identified and what were the project's prioritization processes?

The USFS considered the Beaver River Watershed, with its hydropower infrastructure, drinking water supply, and WUI communities an area of concern for over a decade. Although funding was not available to treat at the scale necessary to mitigate fire hazard, the BRD completed three hazardous fuels reduction

NEPA analyses throughout the 2010s. After signing the Shared Stewardship agreement, a joint mapping exercise through Utah's State Forest Action Plan revision highlighted the watershed as a top priority for the state. Interviewees said NEPA-readiness along with this alignment between the USFS and state government made the project a natural selection to receive initial Shared Stewardship dollars.

Operating through informal collaborative networks developed over nearly two decades, district personnel identified areas near or adjacent to state and private land where treatment was planned or had already occurred to maximize impact across boundaries. Projects protecting hydropower and drinking water infrastructure were also prioritized due to their importance to Beaver City. Interviewees involved in the planning process stressed that the first thinning projects were strategically placed to reduce the cost of future management actions and that the sequence of treatments would eventually allow the BRD to treat acres through larger prescribed burns.

How did partners collaborate, and how were private landowners involved?

Most interviewees discussed the network of collaborative relationships the BRD and partners developed over the preceding decades and their importance to the success of the project. Some interviewees credited long-serving district employees for fostering relationships that allowed project partners to collaborate effectively. For example, the district fuels specialist was singled out for their leadership in bringing the initial suite of partners together over the last few decades, and for their work reaching out to new partners once Shared Stewardship dollars became available. Some interviewees also commended the leadership of the local fire warden, whose work with homeowners' associations led to a culture of fire risk mitigation that also provided opportunities for private landowners to build relationships with state and federal agency staff members. Specifically, interviewees discussed mastication events coordinated by the fire warden and members of the USFS where private landowners could chip biomass from fuel mitigation efforts and then attend a Department of Forestry, Fire, and State Lands barbecue to mingle with personnel from both agencies.

What cross-boundary authorities, mechanisms, and associated funding streams were in play?

All interviewees familiar with Shared Stewardship funding from the state spoke positively about its impact. Many interviewees focused their discussions on how Shared Stewardship dollars led to an expanded number of partners. Once the project became a top priority for both the USFS and the state of Utah, BRD employees began to leverage newly awarded federal and state Shared Stewardship funds by meeting with other stakeholders in the area and brainstorming shared projects. In one instance, Shared Stewardship dollars provided the USFS an opportunity to reduce fuels adjacent to a SITLA parcel slated to be treated, facilitating cross-boundary work with an agency not initially a part of the larger project. Interviewees said momentum generated by this funding had brought the total number of partners from under five to over a dozen.

Most interviewees said GNA permitted the USFS and the state to share contracting capacity and funding to make progress on shared objectives. Some interviewees said they believed that GNA increased the pace and scale of work by eliminating traditional hurdles to working across boundaries, while others stated they believed that GNA allowed the USFS to bypass internal bureaucratic requirements.

Interviewees also said funding from WRI helped bolster regular USFS allocations and state funding associated with Shared Stewardship. They said that Fishlake National Forest staff members exhibited great skill in applying for this type of funding, and the abundance of NEPA-ready watershed improvement projects in the Beaver River Drainage made it an attractive place to award those funds.

Interviewees relayed that the project utilized Utah Catastrophic Wildfire Risk Reduction funds to support much of the work in private subdivisions within the larger project boundary. To award these funds, regional fire councils prioritize projects based on submitted proposals and refer exceptional candidates to the state level for consideration. Once the state selects awardees, the legislature allocates money and divides it to cover those projects. Crucially for the Beaver River Project, a significant portion of this money was designated for Shared Stewardship priority areas, and interviewees said the project, therefore, enjoyed an intrinsic advantage over other proposals.

Interviewees within the USFS spoke of how Indefinite Delivery/Indefinite Quantity contracts allowed the Fishlake to nimbly spend money at the end of the fiscal year. They said the USFS could keep their limited supply of private contractors on call and expand projects as opportunities arose by utilizing these contracts. Interviewees said budget modernization made it easier to allocate this money but likely reduced the overall amount of funds available due to the separation of salary costs from implementation.

What were the key challenges?

Interviewees said that differences in funding timelines between the USFS and other organizations often resulted in missed deadlines and opportunities. To realize opportunities, interviewees said that district employees must complete substantial amounts of extra paperwork and need extra time from forest and regional leadership to be successful. Interviewees cautioned that district-level efforts to capitalize on time-intensive opportunities would be futile without supportive leaders at these higher levels who were willing to prioritize work on the Beaver River Project over other responsibilities.

Interviewees in both the USFS and state agencies said they believed inadequate contracting, grants and agreements capacity within the USFS inhibited increases to the pace and scale of projects. Some interviewees also discussed the complexity of the USFS's contracting and grants and agreements systems and commented that staff turnover made it difficult to improve the process's efficiency. Interviewees added the lack of capacity increased the workload of agency personnel outside of these departments.

Multiple interviewees said the lack of industrial capacity in the area restricted the type and amount of work possible. Interviewees said the one mill in the area did not show interest in the project and, to date, was not involved. They discussed the lack of log buyers in the area and the small number of contractors available to complete hazardous fuels reduction work. One interviewee specifically said they believed the project had reached its apex in scale because no additional contractors were available to take on thinning contracts.

APPENDIX B – INTERVIEW GUIDE

Interview Guide

1. Briefly describe your current position or role with your agency or organization, as well as your specific role regarding this project.
2. What are the primary objectives of this project?
3. What different jurisdictions or landowners are involved?

Prioritization/Partnerships

1. How was this landscape identified or prioritized?
    a. What processes were used to identify this project and to plan it?
    b. Collaborative prioritization or dialogue?
    c. Scientific process?
    d. Leadership directives?
2. How does this fit into other management plans or prioritization?
3. Any connection with Shared Stewardship conversations that started after 2018?
    a. Would this project have happened regardless of Shared Stewardship MOUs or the Strategy?
4. What partners have been involved with the planning of this project?
5. Are there collaborative groups that are tracking, coordinating, or monitoring this project?
6. Are there partners or places that you wanted to involve or should be involved and aren't yet?
7. Are there other key benefits or drawbacks of working together?

Policies/Funding/Capacities and Specific Benefits and Challenges

1. Other than the usual policies you always comply with, can you talk about the different cross-boundary authorities and policies that you're using for this project?
2. What funding sources, including different agency funding streams, are contributing to the project? Any other "in-kind" sources?
3. Have you found any challenges or lessons learned in mixing policies or funding streams?
    a. Any challenges specifically working across jurisdictions or combining State and Private and National Forest funding?
    b. What would make it easier in an ideal world to work across boundaries and what's the next step in improving this process?
4. What have been some of your other primary challenges?
    a. Are there policy, capacity, or other gaps/challenges or needs in order to better facilitate cross-boundary work? What will success look like?
5. What have been factors that have facilitated success?
6. Any message for agency leadership or key partners about ways they could better support success?
7. Were there any new processes or approaches that you haven't used before?
8. Are there resource areas or project objectives that aren't included in this project but should be?

Follow Up

1. Is there anything about this project or these efforts that we have not discussed yet that would be helpful for us to know?
2. Do you have any recommendations of other people or organizations we should be sure to contact?

Additional/potential interview questions if time allows

1. What is the historical context of the forest service to public/stakeholders in this area?
2. What is the local collaborative context for this project area?
3. What have they learned so far that they have or can apply to future SS efforts?

APPENDIX C – CODEBOOK

Code ("code name")	Description

"ID + Prioritization"	• Use this code when an interviewee discusses how this landscape/project was first formally identified by agency personnel.
	• Use this code when an interviewee describes specific processes that were used to prioritize a project.
	  o Use of scientific tools (+ data)
	  o Use of collaborative forums
	  o Use of public meetings
	  o Leadership direction
	• This code is specifically about *how* a landscape was identified/prioritized, so it might end up double coded with "collaboration/coordination" or "leadership" or "communication and outreach", but double code only if there are specific mentions of "collaboration led to this" or "so and so's leadership brought this to our attention."
	• Specific, detailed descriptions of how locations are chosen, general descriptions of where they put a project will go under "Landscape and community context" because it refers more to which objectives are important.

"Landscape and Community context"	• Use when the interviewee describes the primary project objectives. • Use for descriptions of the landscape/community history that set the stage for the project. • Use for descriptions of ecological context. • Use for descriptions of public perception toward agencies, actors, or the project. • Use for descriptions of political context. • Job and role descriptions for later review. • Conditions that led to prioritization strategies • Progress to date.

"Leadership"	• Use this code when the interviewee describes how leadership has impacted this project
	  o Local agency leadership
	  o High-level agency leadership

"Leadership"	○ Specific actors whose leadership has impacted project progression, but may not be a part of an agency • If the interviewee describes "agency culture", that is often tied directly to agency leadership. Use this code if the excerpt is about how "the agency" is doing things a certain way. ○ If it is about a certain, specific *policy* then code it "intra-agency policies/practices." • Don't use this code if somebody is talking about leadership in a first person context, rather code for the subject matter they say they're leading on. • **MEMO WHEN IN DOUBT.**
"Intra-agency policies/practices/conditions"	• Policies that pertain to a specific agency and organization (or governmental branch). ○ This gets tricky with "Leadership", a good rule of thumb is if it's *written* it should go here. If it is specific written leadership directive, double code it as "leadership" and "intra-agency." • Discussions of turnover or lack of capacity should go here. ○ Not for discussion of inabilities to hire more people, that belongs in 'funding structures' unless it is tied to a certain hiring policy. ○ Larger agency-wide context that the project encounters, general discussions of these conditions. Use if you can't pinpoint to a specific leader. ○ Culture that spans multiple leaders would fit in here, though depending on how it's phrased it might go better in 'Leadership'. Culture can be belief structures or politics within the agency or how people within the agency interact with one another. **Memo when in doubt.**
"Innovations"	• Code this when an interviewee describes something they perceive to be *different* from past projects or efforts that has made this project successful. • Code this when an interviewee describes something they perceive as *new* that set up the success this project is having.

"Innovations"	• **Do not infer here**, this is only for when the interviewee explicitly says that something was new or innovative. o "What we did differently with this project is…." • Often will be a double code.

"Authorities/Mechanisms/documents/policies for Cross-boundary work"	• Use for descriptions of authorities/mechanisms that the USFS can use to implement cross-boundary work or expand their capacity.
	  o Joint Chiefs
	  o Good Neighbor Authority
	  o Wyden Amendment/Authority
	  o Steven's Amendment/Money
	• Pros/Cons of using certain authorities/mechanisms.
	• Why they chose (or chose not) to use a certain authority/mechanisms.
	  o Where they can use a certain authority.
	• Use for descriptions of how Shared Stewardship affected the project.
	• **MEMO WHEN IN DOUBT.**

"Funding Structures"	• Use this for descriptions of how agencies/partners can or cannot use funding.
	  o Budget Line Items….i.e. Hazardous Fuels, Wildlife, Recreation
	  o "Color of money"
	• Double code with authorities/mechanisms **if the mechanism provides funding**, and the interviewee discusses specifically how the mechanism restricts or gives opportunities to use the money.
	• Use this for descriptions of *where* agencies/partners can utilize funding.
	• Use this for descriptions of budget timelines
	• Use this for descriptions of capacity if the interviewee talks about not having enough staff to do what they want to do *because of the way a budget is structured.*
	• Use this for discussions surrounding "Budget Modernization."

"Funding Structures"	• Use this when the interviewee describes "joint funding" in detail, not just that two agencies or partners decided to fund something jointly. • Use when the interviewee describes how the agency/partner is mixing or matching funds. • Specific discussions of funding mechanics. • Not being able to fund the project for certain reasons. • A general lack of funds should also be placed here, unless it is specific to one agency, i.e. most agencies/organizations have enough money but not a certain one. Then it would go into intra-agency.

"Collaboration/Coordination"	• Use this code for descriptions of how agencies/partners are working (or not working) together (as well as who is involved and who is missing).
	• Use this code for discussions surrounding the building of trust/relationships.
	• Discussions of prior relationships and past collaboration should go here.
	• Discussions of coordinator positions that oversee the project should go here
	  o If it's talking about how specific coordinator actions have been integral to the project's progression, code that as "leadership", if its talking about the general importance of the coordinator, code it here.
	• Use this code for descriptions of how agencies and partners are sharing information/data/generally communicating.
	• Use this for discussions regarding
	  o Steering committees
	  o Collaborative forums (not forest collaboratives unless they are key to the prioritization/planning/implementation, forest collaboratives would generally go under 'outreach/communication').
	• How a project fits into a larger management plan.
	• Benefits and drawbacks of working together.

"Partner roles"	• Use this code when an interviewee describes what roles different agencies/partners have played in the project.

“Partner roles”	• Discussions of monitoring project outcomes, and whose responsibility it is to complete monitoring. • Discussions of cross-boundary mou’s or strategies that are used to define how different players work in different places or in different ways. • Discussions of how different partners have influenced the project’s direction.
“Communication/outreach”	• This code should be used for excerpts where the interviewee discusses how agencies/partners are reaching out to members of the public. • This code should be used when the excerpt describes ways in which one agency built relationships with another. If it's just generally saying that one partner started working with another that goes under “collaboration/coordination’). • Descriptions of how the project is working to build social license should go here. • May be double coded to “partner roles” if participant talks about how public influenced the project through an outreach process. • Discussion of partners who are not yet part of the process.
“Outcomes/Perf. Metrics”	• Use this code when interviewees describe what they believe success looks like for the project. • Use this code when the excerpt includes discussions of performance metrics and their efficacy. • Use when interviewee describes alternative performance metrics and gives reasoning behind the alternative. • Discussions of when objectives are overlooked.