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## Defining Landscape-Scale Collaboration as Used to Restore Forests and Reduce Catastrophic Wildfires

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## Defining Landscape-Scale Collaboration as Used to Restore Forests and Reduce Catastrophic Wildfires

### Abstract

In this article, I explore the distinctive characteristics of landscape-scale collaboration in the context of forest resource management in the United States. The United States (US) is experiencing a significant increase in acres burned by wildfire in the wildland-urban interface zone, exacting a heavy toll on human life, health, property, and livelihoods. The US Forest Service's Collaborative Forest Landscape Restoration (CFLR) Program demonstrates an effective approach to reducing risk of catastrophic wildfire through collaborative forest restoration work at the landscape scale. This is the first in a series of articles building toward a grounded theory to guide development of the capacities needed to collaborate at this scale. The study is based on thirteen interviews and nine focus groups with CFLR Program participants. This article addresses the research question: What is unique about collaborating at the landscape scale? Findings include five characteristics that together define this form of collaboration and insights on how participants framed their focal landscapes. I explain the catalyst for these collaboratives, scope of the study, and context for my involvement. I review pertinent literature and then describe the methods I employed in this study. Finally, I present and discuss my findings and offer suggestions for further research and management recommendations. Subsequent articles in this series will identify the capacities needed to collaborate in this context, present a theory informing strategies for cultivating these capacities, offer additional management and policy recommendations, and suggest curricular implications.

### Keywords

Landscape-Scale Collaboration, Forest Resource Management, Wildfire, Collaborative Governance, Grounded Theory

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# Defining Landscape-Scale Collaboration as Used to Restore Forests and Reduce Catastrophic Wildfires

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*In this article, I explore the distinctive characteristics of landscape-scale collaboration in the context of forest resource management in the United States. The United States (US) is experiencing a significant increase in acres burned by wildfire in the wildland-urban interface zone, exacting a heavy toll on human life, health, property, and livelihoods. The US Forest Service's Collaborative Forest Landscape Restoration (CFLR) Program demonstrates an effective approach to reducing risk of catastrophic wildfire through collaborative forest restoration work at the landscape scale. This is the first in a series of articles building toward a grounded theory to guide development of the capacities needed to collaborate at this scale. The study is based on thirteen interviews and nine focus groups with CFLR Program participants. This article addresses the research question: What is unique about collaborating at the landscape scale? Findings include five characteristics that together define this form of collaboration and insights on how participants framed their focal landscapes. I explain the catalyst for these collaboratives, scope of the study, and context for my involvement. I review pertinent literature and then describe the methods I employed in this study. Finally, I present and discuss my findings and offer suggestions for further research and management recommendations. Subsequent articles in this series will identify the capacities needed to collaborate in this context, present a theory informing strategies for cultivating these capacities, offer additional management and policy recommendations, and suggest curricular implications. Keywords: Landscape-Scale Collaboration, Forest Resource Management, Wildfire, Collaborative Governance, Grounded Theory*

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## Introduction to the Research Problem

The United States (US) has experienced an alarming rise in acres burned by wildfire in the zone where wildlands and human communities meet (known as the wildland-urban interface, or "WUI"). Wildfire in and of itself is not a problem, since certain ecosystems depend upon fire to maintain ecological health (Brusentsev & Vroman, 2016). Forest managers are increasingly using "prescribed" fire as a vital tool for reducing the likelihood of catastrophic wildfire. However, the latter is taking a rising toll on human life, health, property, and livelihoods, with particularly dramatic examples occurring in heavily populated areas of both northern and southern California in 2017.

Humans are the main source of nonprescribed wildfires. The problem stems from human presence and behaviors, including irresponsible fire-related activities that set wildfires in motion, development patterns that increase exposure to wildfire risk, and fire suppression practices that increase fuel accumulation. We start them accidentally by letting our campfires and garbage burns escape their bounds or being careless with cigarettes. Some are started intentionally, by arsonists (Theobald & Romme, 2007).

If today's problems with catastrophic wildfires are caused by humans, it also is humans who can work together to change this trajectory. Rasker (2015) calls for a "national conversation" on how to redirect future development to reduce risks. Brusentsev and Vroman (2016) name "community education and involvement" as a key element of the solution. The Western Governors Association (as cited in Schultz, Jedd, & Beam, 2012) recommended creating a learning network to foster knowledge-sharing about how to address this problem. Landscape-scale collaboration on forest resource management is another phenomenon that has taken hold to help deal with this challenge, that is, stakeholders working together on a scale larger than that of a single project and smaller than a country to develop and implement forest restoration plans that reduce vulnerability to catastrophic wildfire (among other benefits). This is, admittedly, quite a broad definition. Yet, landscape-scale collaboration is producing results, and warrants expanded use. To use this resource management approach for maximum benefit, we need to better define and understand it. Through this study, I seek to deepen our understanding of what landscape-scale collaboration is, what is required to do it effectively, and how to cultivate those capacities. This article is the first in a series reporting on the findings from this study.

### **Rationale for Study**

The number of buildings consumed by wildfire in the US has tripled since 1990; today, scholars estimate 70,000 communities are exposed to wildfire risk (Rasker, 2015). Sixty percent of homes built in the US since 1990 have been constructed in the WUI (Rasker, 2015). As of 2008, forty percent of all single-family residences in the US—46 million dwellings—were at risk from forest fires. Given these building trends, it is not surprising that we have historically suppressed forest fires in the US; this policy has been driven by both safety and economic factors (e.g., loss of marketable timber to wildfire). However, suppressing forest fires has resulted in a massive accumulation of fuel for today's fires. Our changing climate exacerbates these risks (Rasker, 2015) by extending the fire season, amplifying the size of wildfires—both total acres burned and average acres per wildfire (Brusentsev & Vroman, 2016). Prior to 1990, wildfires burned an average of 32.8 acres per fire; as of 2013, this number had more than tripled to 108.1 acres per fire (Brusentsev & Vroman, 2016). Increases in wildfire intensity are of particular concern (Stephens et al., 2018).

The cost of wildfire in terms of human lives and health also continues to rise. An average of 17.2 firefighters lost their lives in the line of duty during the 1990s, while 34 died in 2013 (Rasker, 2015). Smoke from wildfires contains particulate matter, carbon monoxide, ozone, volatile organic compounds, trace gases, air toxics, and mercury (US EPA, 2012). According to Coefield (2017), particulate matter "aggravates asthma symptoms and causes reduced lung function. ... It increases the risk of heart attack and stroke and can damage children's developing lungs." Wildfire-related health costs can be measured in terms of increased mortality due to respiratory and cardiovascular causes, emergency department visits and hospital admissions for asthma, COPD, pneumonia, and heart failure, outpatient treatment, self-treatment, work-loss days, and restricted activity days (Kochi, Donovan, Champ, & Loomis, 2010). An average of 17.2 firefighters lost their lives in the line of duty during the 1990s, while 34 died in 2013 (Rasker, 2015). The cost of health-related risks associated with a single wildfire in the Canadian province of Alberta in 2001 was estimated at \$9 to 12 million (University of Alberta, 2006). Richardson, Champ, and Loomis (2012) calculated the human health impacts from exposure to wildfire smoke at \$84.42 per person exposed per day.

The human cost of wildfire also is reflected in tax dollars spent on fire suppression, which limits the availability of these tax dollars for other human needs. Federal agencies spent "only" an average of \$371 million annually on fire suppression between 1985 and 1989, but

this increased to an annual average of \$1,548 million between 2009 and 2013. According to Rasker (2015), the wildfire management work of the US Department of Agriculture's Forest Service (USDA/FS) took 51 percent of the Agency's budget in 2014, up from 17 percent in 1995.

Costs that need to be factored into the equation besides fire suppression and human health impacts include those incurred pre-suppression, losses associated with reduced supply of timber and recreation opportunities, ecosystem damage, and disaster relief efforts (Butry, Mercer, Prestemon, Pye, & Holmes, 2001). In sum, wildfires in the US "are larger, burn longer, inflict more damage, and kill more people than ever before" (Rasker, 2015).

While this article focuses on a US context, the threat of catastrophic wildfire is one faced in many other parts of the world as well. Liu, Stanturf, and Goodrick (2010) identify a climate change-driven increase in the potential for wildfires not only in the US, but also in South America, Australia, central Asia, southern Europe, and southern Africa.

If today's problems with catastrophic wildfires are caused by humans, it also is humans who can work together to change this trajectory. However, joint problem-solving is not something that comes easily in the context of managing the national forests of the United States (US). In fact, conflict is inherent in their management because: a) the USDA/FS is legally mandated to steward these forest resources in a sustainable manner for a variety of uses (recreation, timber, wildlife, water, and grazing); and b) those with stakes in the way that the USDA/FS manages these forests number in the millions. The USDA/FS estimates that there were at least 148 million visits to the national forests for recreation purposes alone in 2016 (USFS, 2016). These users have a range of opinions about appropriate management objectives for their forests, which often puts them in conflict with one another and with the Agency's professional resource managers. Additional sources of conflict include procedural issues (e.g., whether stakeholder input was adequately considered by Agency decision-makers); ideology (e.g., the merits of protecting additional portions of the national forests as wilderness); and a cluster of challenges related to collaborating at the landscape scale (fear of the potentially large consequences of mistakes, given the vast scientific unknowns involved; translating landscape-scale agreements into on-the-ground projects; and challenges from external parties, given the huge number of stakeholders).

Conflicts over national forest management virtually incapacitated the Agency in the late 20<sup>th</sup> Century due to the volume of forest management plan appeals filed by environmental advocates. The USDA/FS has undergone profound changes since that era, most visibly reflected in the 2012 Planning Rule, which encourages collaboration throughout the development of forest management plans. Nevertheless, the conflict associated with the Agency's mission must be managed constructively for the Agency to function effectively. While other agencies have led the way in the use of mediation for polarized conflicts, the USDA/FS has built collaboration into the "upstream" phase of its decision-making processes. Increasingly, the focus of such collaborative planning and management efforts is at the landscape scale. The USDA/FS' Collaborative Forest Landscape Restoration (CFLR) Program is a prominent example of this phenomenon and represents one way in which humans are grappling with the challenge of catastrophic wildfire in the US.

The USDA/FS launched the CFLR Program in response to the Omnibus Public Land Management Act of 2009, Title IV, and it has become a key component of the Agency's forest restoration program (USFS, as cited in Schultz, Jedd, & Beam, 2012). The Program was charged with reducing the risk of wildfire while creating jobs through restoration of priority forest ecosystems using science-based, landscape-scale collaboration (USFS, 2012). Funds were allocated to 23 landscape-scale collaborative forest restoration projects on a competitive basis. For purposes of this program, "landscape" was defined as 50,000 acres or more; projects

selected ranged in size from 130,000 to 2,400,000 acres (USDA, 2015). Funded projects receive ten years of federal funding, subject to a cost-share requirement.

The Program reports very tangible achievements flowing from these 23 projects between 2010 and 2016 (USFS, 2017), including: (a) restoration work on more than 2.4 million acres, lessening the risks of catastrophic wildfire; (b) wildlife habitat improvement on over 2 million acres; (c) work to remove invasive vegetation on over 117,000 acres; and (d) reforestation of over 121,000 acres (USFS, 2017). Between 2011 and 2016, these 23 projects generated or sustained an average of 5,180 jobs per year and \$1.2 billion in local labor income. Participants in these projects sold more than \$2.1 billion board feet of timber between 2010 and 2016; during this period, they also constructed over 90 miles of stream improvements to ease fish passage and conducted trail maintenance work on 630 miles of trails. Further, between 2010 and 2015, the CFLR Program leveraged over \$297 million in non-federal funding.

### **Research Objective and Research Questions**

The benefits resulting from landscape-scale collaboration in the context of the CFLR Program are very compelling to the USDA/FS, participating stakeholders, and elected officials. Those who experience the tangible results emerging from this collaborative governance approach would like to know how to cultivate more of it. That is the objective that drives the present study: learning how to build interested organizations' respective abilities to use landscape-scale collaboration to achieve shared forest management goals. I sought to answer the following three research questions: (1) What is unique about collaborating at the landscape scale compared to other scales? (2) What are the implications of those unique characteristics for collaborative capacity-building strategies of those wanting to use this approach? (3) What is the relationship between landscape-scale collaboration and conflict resolution? In this article, I report solely on findings pertaining to the first of those questions. Subsequent articles will address findings pertaining to the other two research questions, propose a theory to guide collaborative capacity-building strategies, and offer management and policy recommendations and curricular implications.

### **Intended Audience and Benefits**

I hope that these findings will contribute to the work of forest resource managers, stakeholders interested in collaborating at the landscape scale, facilitators of such processes, and fellow scholars working on related topics. The landscape-scale collaboration phenomenon is compelling at an intuitive level and has produced remarkable results. By deepening our understanding of this phenomenon, we can make more intentional choices about when and how we invest in "more of it." In so doing, it is my hope that together we can amplify the good results of which it has proven itself capable, that is, restoring forest ecosystems; reducing the risk of catastrophic wildfire and the associated threats to human life, health, property, and livelihood; and creating jobs in the process.

### **Role of Researcher**

My professional identity informed the focus of this study. I am a "pracademic," that is, both a practitioner and a scholar of the phenomenon of interest (landscape-scale collaboration). I hold an undergraduate degree in Environmental Studies, a master's degree in Natural Resource Policy, Economics, and Management, and a doctorate in Conflict Analysis and Resolution. I have worked as a facilitator and mediator of environmental and natural resource issues for over thirty years. In that role, I design, facilitate, and mediate consensus-building

processes through which stakeholders can negotiate mutually-acceptable solutions to shared challenges. I also help organizations and individuals strengthen their respective capacities to use collaborative strategies constructively, both with the assistance of facilitators and mediators and on their own; this form of assistance is known as “collaborative capacity-building.”

Between 2009 and 2011, under a contract with the USDA/FS, I served as the facilitator for the federal advisory committee that guided the launch of the CFLR Program. The Department tasked the 15-member “CFLRP Advisory Committee” with reviewing proposals from stakeholder groups who sought USDA/FS funding for 10-year, place-based collaborative efforts to restore landscapes that included some, or all, of a national forest or grassland. At the Department’s request, the Committee made consensus-based recommendations to the US Secretary of Agriculture on which proposals to fund. My role was to organize and facilitate Committee meetings, enabling all participants to contribute constructively, help them stay on task, and support their efforts to reach agreement on their recommendations without influencing the content of those recommendations.

During this same period, I entered a doctoral program in Conflict Analysis and Resolution at Nova Southeastern University. When the time came to choose a dissertation topic in 2012, I wanted to select a topic that would enable me to contribute to our knowledge of collaborative capacity-building processes. I was particularly interested in looking at this subject at the landscape scale because my experience as a collaboration practitioner left me with the sense that this scale of collaboration seemed to enable maximum “traction” and tangible beneficial impacts relative to collaborative natural resource management at other scales.

My experience with the CFLRP Advisory Committee was fresh on my mind. I recognized that the CFLR Program offered an ideal opportunity to study collaborative capacity-building because there were sufficient collaborative projects for a defensible sample size, while at the same time, the CFLR Program was structured in a way that made for a manageable study. CFLRP-funded projects had to be at least 50,000 acres in size, while other landscape-scale collaborative initiatives involved much larger geographic areas, even more stakeholders, and more diffusely organized stakeholders. My familiarity with the program would enable me to get my doctoral research underway expeditiously. My familiarity with CFLRP Advisory Committee members and the credibility associated with having facilitated the Committee would facilitate the access to program participants that I would need for data collection.

Studying collaborative capacity-building in the context of the USDA/FS and its landscape-scale collaborative forest management efforts was compelling to me because I knew that the topic had high policy relevance. Since the 10-year CFLRP-funded projects were just getting underway, whatever I might learn about collaborative capacity-building could directly support the effectiveness of those projects. Moreover, the USDA/FS had just promulgated its 2012 National Forest System Land Management Planning Rule<sup>1</sup> (the “2012 Planning Rule” hereafter) under the National Forest Management Act.<sup>2</sup> The 2012 Planning Rule supported USDA/FS personnel in working closely with stakeholders on planning for, and managing, the nation’s forests. In 2011, to support implementation of the stakeholder engagement requirements of the 2012 Planning Rule and other agency initiatives such as those on climate change and watershed protection, the USDA/FS had contracted for my assistance to help design and conduct an agency-wide assessment of its collaborative capacity and develop recommendations for how to enhance it (DuPraw et al., 2015). My involvement in this work heightened my awareness of the timeliness and practical value of research on how to build the capacity to collaborate at the landscape scale on forest resource management.

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<sup>1</sup> National Forest System Land Management Planning, 36 C.F.R. Part 219 (2012)

<sup>2</sup> National Forest Management Act of 1976, 16 U.S.C. Section 1600

Before proceeding with this study, I considered whether I was too close to the topic of landscape-scale collaboration to bring an open mind to its study. Positivist social research seeks to develop findings that can be generalized with validity: universal truths (Willis, 2007); However, this study reflects an interpretivist frame of reference, that is, the perspective that humans' study of one another is an inherently subjective endeavour (Denzin as cited in Willis, 2007, p. 160). As with qualitative research generally, the human researcher is viewed as the primary data collection "instrument" (Willis, 2007, p. 203). He or she fulfils this function by drawing upon his or her totality of experience and knowledge (Gadamer, as cited in Willis, 2007, p. 189), combined with methodological rigour. I did know quite a lot about collaborative capacity-building due to my professional training and experience. To minimize possible distortion arising from my past experiences that could impede my ability to consider new information about landscape-scale collaboration and collaborative capacity-building, I asked interviewees and focus group participants to review preliminary findings. For this same reason, and to ensure the ethical integrity of my inquiry, I obtained review and approval of my proposed research methods by the Institutional Review Board of my university.

### **Literature Review**

There are widely differing perspectives on when and how qualitative researchers should consult the literature as they carry out research projects (Hart, 2009, p. 1). Chenail, Cooper, and Desir (2010) suggest that the primary functions of a literature review in qualitative research are to: a) delineate the phenomenon being studied; b) frame the research gap the author seeks to fill; c) help establish the rationale for the selected research methodology; and d) provide a basis for comparing the research findings with what was previously known and unknown about the subject. Consequently, I undertook the literature review for this study in two phases.

I undertook the first phase of the literature review—functions (a) through (c) with an initial cut at (d)—in the process of developing my research proposal. I carried out the second phase—a more extensive version of (d)—following data analysis to avoid biasing that analysis, while still drawing upon the literature to formulate conclusions about the implications of the analysis (Chenail, Cooper, & Desir, 2010). For purposes of this article, I include literature on the following three topics: what we mean by "landscape"; what we mean by "collaborative governance"; and what we know about collaborative forest management at the landscape scale. My review of the literature indicated that there is no existing empirically-based theory specifically guiding practitioners' efforts to build conveners' and stakeholders' capacity to collaborate at the landscape scale on forest resource management. Subsequent articles in this series will review pertinent aspects of the literature in more detail.

### **What Do We Mean By "Landscape?"**

There is significant literature that seeks to elucidate the concept of a "landscape." Some writers approach the topic from the closely-related ecological and geographic perspectives, while others analyse the topic through the lenses of social science, archaeology, anthropology, and aesthetics. For purposes of this study, I will focus on literature from the ecological and geographic realms and/or other literature directly related to how the USDA/FS conceptualizes the phenomenon of a "landscape." As discussed below, variables that affect how we define the boundaries of a landscape include: species, phenomenon and patterns of interest; the mechanisms that drive those patterns; the scale at which the observer views the ecosystem and associated biases; humans' cultural, spiritual, and functional relationships with the natural world in a particular place; and research questions.



According to Wiens and Milne (1989, p. 87), “landscapes” are typically conceptualized as “Arenas in which humans interact with their environments on a kilometres-wide scale.” (The definition used by the CFLR Program focuses on size: 50,000 acres or larger.) However, Wiens and Milne study micro landscapes, such as that of a beetle. They assert that the way in which a landscape is defined for purposes of scientific investigation depends on the species, phenomena, and research questions of interest.

Indeed, the choice of scale at which an observer views an ecosystem has been called the “central problem in ecology,” given the influence of this choice on the patterns the scientist will be able to discern (Levin, 1992, p. 1943). Levin points out that many practical challenges (e.g., climate change predictions) require integration of phenomena and data from a range of scales with respect to time, space, and ecological unit. He notes that there is no one scale at which ecological phenomena are supposed to be studied, and that ecological systems usually reflect “characteristic variability” at multiple scales (p. 1943).

McKinney, Scarlett, and Kemmis (2010) offer a strategic framework for advancing the practice of large landscape conservation (a term that is often used synonymously with landscape-scale collaboration). Their report is based on two policy dialogues and associated discussions held at the national level in 2009; it is grounded in the description of conservation initiatives on seven large landscapes. The authors highlight the associated value of working on land and water problems at an “appropriate” geographic scale, rather than being constrained by jurisdictional boundaries (p. 2).

Cunningham (2010) notes the importance of considering changes that take place over time when framing the “landscape” one will study. “In trying to gain some understanding of how biological landscapes operate, you need to study interrelationships, and to do this you need to decide how to measure moving processes” (Cunningham, 2010, p. 49, paraphrasing conservation biologist Dick Richardson). He adds, “Change is always happening. Change is the most natural part of our landscape, and change is what we must embrace and learn to live with, for our ... landscape will be swept along in its continuing currents...” (p. 15).

Levin notes that the observer’s selection of a particular scale inevitably reflects some degree of bias in his or her perceptions. He suggests that this bias issue is significant in two important ways (1992, p. 1943). First, it is significant to the scholar’s choice of scales to investigate because patterns associated with one scale are likely to have different causes and consequences than patterns associated with another scale. Second, Levin suggests that this form of bias has evolutionary significance in that adaptations such as changes in dormancy or dispersal patterns can change the scale at which an organism perceives its environment and thus, the variability it observes therein. Levin suggests that, to more accurately understand and predict changes, we need to illuminate the mechanisms that drive the patterns we observe. He asserts that our ability to gain that deeper understanding is complicated by the likelihood that those underlying mechanisms may be operating on a different scale than that of the observed patterns.

The concept of ecosystem services offers a bridge between Levin’s ecological perspective on scale issues and human considerations. This concept refers to the functional values that humans derive from natural resources. According to the Network for Landscape Conservation (2018),

Our landscapes provide clean air and water and healthy outdoor recreation. They buffer us from floods and fire, mitigate climate change, improve public health, and safeguard cultural heritage, wildlife, and ecological systems. Our landscapes provide food, fiber, jobs, and community vitality. And they provide the special sense of place that defines a community and region and—if not diminished—is passed down through the generations. (p. 1)

López-Hoffman, Varady, Flessa, and Balvanera (2010) point out that, when adjacent countries share ecosystems and species, they are also likely to share important ecosystem services. The authors assert that there is an urgent need for strategies to manage shared ecosystem services. They suggest that the concept of ecosystem services holds promise as a central organizing theme for trans-boundary conservation initiatives (such as landscape-scale collaborative processes) because it includes a range of parties, defines conservation in terms of mutual interests, and offers a way of linking and/or trading off between services.

Cash and Moser (2000) also discuss the challenges of integrating science and policy to effectively address environmental problems that have components at multiple scales (e.g., climate change), and then provide recommendations for how to do this more effectively. An example is climate change, which has both local and global components. Three key challenges include: (1) matching the scale of the management system to the scale of the biogeophysical basis of the problem; (2) matching the scale of the problem assessment and of the management response; and (3) adequately accounting for interactions where dynamics occurring at one scale affect those occurring at another scale (Cash & Moser, 2000, pp. 113-118). To better address these challenges, the authors recommend making more extensive use of “boundary organizations” (e.g., landscape-scale collaboratives) that provide forums for communication and interaction between scientists and managers. Further, they recommend consciously leveraging the particular “scale-dependent comparative advantages” of various institutions, technical experts, and resources (i.e., using each at the scale where it is most effective). Finally, they recommend using an adaptive management approach to learn how to better integrate assessment and management at appropriate scales, “constructing long-term, iterative, experiment(s)...” in this area (Cash & Moser, 2000, pp. 109, 114-118).

American Indian and Alaska Native (AI/AN) people have their own way of thinking about “landscapes” managed by the SDA/FS, which needs to be factored into landscape-scale collaborative management efforts. USDA (2012) notes that the USDA/FS is responsible for the stewardship of 193 million acres of public lands, that “all or part of every national forest is carved out of the ancestral lands of AI/AN people,” that the longstanding and spiritual relationship of AI/AN people to these landscapes remains, including the presence of countless AI/AN sacred sites on the national forests (USDA, 2012, pp. 6-7). The report explains that many AI communities believe they have a cultural responsibility to care for the natural world and that doing so includes specific ceremonies that must take place at these particular sites.

In his book, *Wisdom Sits in Places*, Basso (2000) shares what he learned through ethnographic and linguistic fieldwork between 1979 and 1984 with the Western Apache people near Cibecue, Arizona. He wanted to understand the meaning that the Apache invested in the names of particular places. He learned that the origin of each place-name lies in a story, and that these stories embody all kinds of cultural wisdom tied to events that happened in that place in the past. Thus, the Apache people who make their home in the Cibecue area can communicate layers of meaning by simply referencing a particular place. As Basso observes, “Apache constructions of place reach deeply into other cultural spheres, including conceptions of wisdom, notions of morality, politeness and tact in forms of spoken discourse, and certain conventional ways of imagining and interpreting the Apache tribal past” (2000, p. xv). Basso helps us understand how a landscape can be integral to the identity of the people who inhabit it—not just to their current identity, but to their history and the evolution of their culture and their hopes to sustain their culture into the future. Similarly, Cunningham asserts that, “The land has a memory,” which reflects the history of that landscape and “the life-forms that live on it, including ourselves and our experiences” (Cunningham, 2010, pp. 12, 299). Thus, the literature suggests that both social and ecological variables must be considered in defining the boundaries of a landscape.

**What Do We Mean By “Collaborative Governance”?**

Landscape-scale collaboration can be thought of as a form of collaborative governance (defined below). Thus, collaborative governance scholarship illuminates the milieu in which this study is situated. These scholars' insights regarding characteristics, variations, and obstacles related to collaborative governance informed my thinking about potential dimensions of study participants' experience with landscape-scale collaboration. I drew upon their work in developing interview and focus group questions to ensure the questions were framed in a way that would give study participants room to surface any related insights from their own experience, albeit without leading them in any particular direction.

There are multiple streams of literature about collaborative governance. Perhaps most fundamental is scientific literature on evolutionary drivers for cooperative behaviour. For example, Nowak (2012) explains why cooperation is part of our evolutionary process. The author describes five evolutionary mechanisms that govern; these include direct reciprocity, spatial selection, genetic or kin selection, indirect reciprocity, and selfless acts for the greater good. According to Nowak, indirect reciprocity is the most common reason people help one another; this refers to decisions to help others based upon the reputations of those in need. One term used for collaborative governance in the environmental arena is "cooperative conservation" (Van de Wetering, 2006, p. 6).

Emerson, Nabatchi, and Balogh (2012) provide a framework for collaborative governance to advance research on collaborative practice networks. They make a distinction between collaboration and collaborative governance. Collaborative governance, they assert, is a decision-making system characterized by a relatively long temporal dimension, is structural, and focuses on a system. Collaboration, in contrast, involves interaction between individuals or groups on a shorter timeline, and is not systems oriented.

Booher (2004) suggests that collaborative governance can be thought of as a new, "more deliberative and democratic" approach to governance compared to governance that is informed by traditional public participation (p. 32). It occurs in a cross-jurisdictional governance "space," and offers a vehicle through which participants can deal with: a) increasing complexity and uncertainty in the governance arena; b) increasing cultural diversity; c) policy inter-dependencies that prevent any one entity from being able to resolve an issue on its own; and d) the increasing need for trust-building (pp. 32-33).

Milward and Provan (2006) discuss collaborative governance in the context of "networked governance" (p. 8); they use this term to refer to a governance approach in which government leaders manage external networks of organizations to carry out their agencies' respective missions. Donahue (2004) defines "governance" as the "orchestration of collective activity," and essentially that which a government does (albeit not necessarily all by itself) on behalf of the public sector (pp. 2-3). He suggests that "collaboration" refers to "some amalgam of public, private, and civil-society organizations" in pursuit of a common mission (Donahue, 2004, p. 2). DuPraw, Cardwell, Placht, and McGonigle (2012) define collaboration to mean the "full suite of ways in which (an organization) seeks to involve and work constructively with stakeholders" (p. 86). DuPraw, Brennan, and Placht (2013) define collaborative governance to refer to the routine use of collaboration by public sector decision-makers to determine how to resolve challenges, controversies, or outright conflicts over the best way to manage the public resources under their stewardship (p. 229).

Scholz and Stiffler (2005) write about collaborative governance in terms of "adaptive governance." They define adaptive governance as "a new generation of governance institutions for resolving collective action problems that occur between different types of resource users" (p. 1). Further, they describe adaptive governance institutions as those "that can both preserve the strengths of existing specialized authorities to exploit natural resources and explore alternatives in order to ensure the sustainability of both human and natural systems" (p. vii).

Emerson, Nabatchi, and Balogh (2012) have developed an integrative framework that can be used by scholars and practitioners to research, practice, and evaluate collaborative governance. The authors define collaborative governance as

The processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres in order to carry out a public purpose that could not otherwise be accomplished. (p. 2)

The authors believe that collaborative governance starts in a “system context” from which critical drivers emerge to activate a collaborative governance regime (CGR). Leadership, interdependence, consequential incentives, and / or uncertainty must be present to activate a CGR. Collaborative dynamics then initiate collaborative action; such dynamics include circumstances that motivate all key stakeholders to consider joint action, the capacity to pursue joint action if they choose to do so, and an approach to engaging stakeholders that is guided by established principles for best practices. This integrative framework looks at collaborative governance as an operational system that interacts with contextual factors. The authors encourage scholars to test the framework with real-world collaborative governance cases, including examples from differing contexts.

### **Collaborative Forest Management at the Landscape Scale**

There is quite a lot of literature pertinent to landscape-scale collaboration on forest resource management, particularly if one includes the watershed restoration literature, and both domestic and international arenas. Because the relevant literature is so vast, I constrain this section of the literature review strictly to landscape-scale collaboration on national forest lands. One such author takes up the question of whether collaborative governance is appropriate at the landscape scale. However, most of the literature identifies benefits of such endeavours and ways to magnify these benefits.

Ingram (2011) explores the question of whether effective collaboration is possible at the landscape scale or is best employed at the local scale (pp. 1-4). She sets her analysis in the context of the “all-lands” approach to natural resource management espoused by Secretary of Agriculture Tom Vilsack and notes that the USDA/FS sees collaboration as “both a strategy and a tool” for forest management (Ingram, 2011, p. 1). She discusses the importance of scale considerations for both natural resource management and collaboration, pointing out that what constitutes a “large” scale varies by organizational affiliation, geography, and management goal. The author refers to a sense of place as being necessary for effective collaboration and notes that a sense of place is “where biophysical, social, cultural, and political priorities meet on the local level” (Cheng and Daniels as cited in Ingram, 2011, p. 1). She further affirms that the effectiveness of a collaborative natural resource management approach depends in part on how it addresses “not only biophysical attributes at different geographic scales, but also the ‘ways of knowing’ among different communities of interest” (p. 1).

The author notes several USDA/FS assets that enable the agency to contribute effectively to consensus-based collaborative natural resource management efforts. These include monitoring and measuring results of various treatments on agency lands, the ability to collect data at varying scales to inform collaborative efforts, the ability to communicate readily with the public at large, the ability to bring resources to bear to help carry out local priorities, and the ability to deploy the expertise of a large pool of natural resource management practitioners. However, the author is concerned about external parties interpreting landscape-scale collaboration as a modified governance paradigm, with unmanageable expectations

regarding inclusive decision-making. Ingram suggests that USDA/FS assets may be better deployed in support of local-scale collaborative efforts, and that the agency should work more in a “cooperative” mode for larger-scale efforts (2011, pp. 2-3).

Butler (2013) looks at the way in which the USDA/FS participated in the collaborative processes used by the first ten projects funded under the agency’s Collaborative Forest Landscape Restoration Program. Butler found that the agency’s participation fell into four different modes, which he labelled “leadership,” “membership,” “involvement,” and “intermittence.” These different modes reflect different ways that agency personnel balanced the inclination to collaborate with the need to comply with relevant legislative requirements, such as those contained in the Federal Advisory Committee Act (FACA). Butler concludes that: (1) fear of FACA can be an obstacle to collaboration, but not an insurmountable one; (2) it is possible for agency personnel to participate in a collaborative effort in meaningful ways without fully integrating into it; (3) agency personnel can participate in collaborative efforts without giving up their statutory responsibilities—the question is how best to participate; and (4) “arm’s length” participation by agency staff tended to reduce procedural concerns and distractions from substantive discussions.

Schultz, Coelho, and Beam (2014) look at the same cohort of CFLRP projects as did Butler (2013) and as does this study (pp. 198-206). They focused on the monitoring component of these projects; the program’s enabling legislation requires monitoring of each project for a fifteen-year period, and the monitoring plan must be both designed and implemented collaboratively (Schultz et al., 2014, p. 198). The authors report on the objectives of the monitoring plans and variables that drove their design (pp. 200-203). They also report on governance arrangements built into these plans, noting that roles tend to be clearly delineated, but procedures for implementing the plans and interpreting results tends to be less clear (Schultz et al., 2014, pp. 203-204). Finally, the authors identify three main challenges to the smooth implementation of the legislative requirement for multiparty monitoring in the CFLRP Program; these include: 1) differentiating between monitoring and research, since CFLRP funds cannot be used to fund the latter; 2) meeting the legislative requirement that monitoring funds be used in the same year in which they are allocated; and 3) obtaining the expertise and time needed to implement these plans, given heavy reliance on stakeholder volunteers (pp. 198, pp. 204-206).

In 2017, Schultz et al. (2017) studied both the CFLRP Program and the Joint Chiefs’ Landscape Restoration Partnership—a joint program between the FS and USDA’s Natural Resources Conservation Service—to discern the benefits of these programs, identify factors that contributed to their success and those that presented challenges, and formulate recommendations related to future use of collaborative restoration programs (p. 1). They administered a survey to 425 agency personnel and conducted 43 interviews with program staff and stakeholders. Their data identified two key success factors: a) the prior existence of collaboration; and b) transparent communication among participants (pp. 3, 15). They also observed that, “(h)aving project goals that align with community, partner and agency goals created a unified vision and limited contention on the landscape” (p. 16).

Wilson and Crawford (2008) address community-based collaboration in an assessment of the San Juan National Forest (SJNF) forest-planning effort that took place from 1998 to 2003. The authors looked at representation and how participation affected the relationship between a national forest and nearby communities. In particular, the authors focused on the Community Study Groups, which were involved in the collaborative process to revise the SJNF forest plan. Using surveys and interviews, the authors found: disproportionate participation of white males, retirees, or those over 65, and people active in past forest planning efforts. Tribal participants were not represented. The authors recommend a broader definition of “community” in assessing participation (e.g., beyond “stakeholders”).

Burns and Cheng (2005) studied the collaborative processes used by seven national forests in Regions 2 (the Rocky Mountain Region) and 4 (the Intermountain Region) in revising their forest plans. The authors sought to use the collaborative forest plan revision processes employed by these forests to develop a menu of options upon which other national forests could draw. The authors found that the agency needed to change how it resources and carries out forest planning, including acknowledging the importance of the intra-agency collaboration process and involving community stakeholders in the pre-planning process. The authors recommended that the USDA/FS view collaboration as a continuous process and work more sustainably with community stakeholders in collaborative partnerships.

Goldstein and Butler (2009) write about the Fire Learning Network (FLN), which was jointly established in 2001 by The Nature Conservancy, the USDA/FS, and the US Department of Interior (DOI) to develop ecologically-based, landscape-scale fire restoration plans spanning multiple organizations and jurisdictions, using a collaborative approach. The need for such an initiative emerged out of widespread wildfires during 2000. The authors suggest that the concept of a “social imaginary” can help us understand how the FLN functions; this concept has its roots in the work of Anderson on the nation as an “imagined community” (1983, as cited in Goldstein and Butler, 2009, p. 1015). Anderson defined a “social imaginary” as a “dispersed collective expectation of how things work now, how they are supposed to work and how to engage with others to make them work that way” (p. 1015).

The authors suggest that a social imaginary reflects bonds of solidarity, even though community participants do not typically know each other personally. It serves as a framework that enables community members to “exercise judgment and select alternatives within a particular field of action,” articulating the “repertoire of ways to engage” (Goldstein & Butler, 2009, p. 1015). The authors make the case that the FLN’s guidelines, protocols, publications, and practices represented a social imaginary, affording participants working on many different landscapes a common set of expectations. They argue that this approach effectively supported, rather than constrained, a collaborative network that has been able to simultaneously “promote learning and innovation within place-based collaboration while catalysing fire management’s long-anticipated shift to ecological fire restoration” (p. 1014).

In a 2018 report, the Network for Landscape Conservation distills insights from a national forum on landscape conservation that drew practitioners from throughout North America. The report spotlights innovations, examples, and strategies for landscape-scale conservation. The authors assert that the “landscape” is becoming the “operative unit for conservation” (p. 2). Citing a 2017 survey of 132 landscape-scale conservation initiatives, they report that almost all those initiatives had begun since 1990—and almost half of them since 2010 (Network for Landscape Conservation, 2017). The authors have found that landscape-scale conservation “brings people together across geographies, jurisdictions, sectors, and cultures to re-weave fragmented landscapes and safeguard the ecological, cultural, and economic benefits they provide” (p. 6).

Tuxill, Mitchell, and Brown (2004) report on the second of two workshops convened at the request of the National Park Service to harvest lessons learned about conservation partnerships in the U.S. The editors noted that American conservation now recognizes the relationship between nature and culture; involves larger-scale, interdisciplinary, and cross-jurisdiction stakeholder collaboration; and is place-based, with respect for local knowledge. This report suggests nine elements of successful partnerships (pp. 20-24), a conceptual model for partnerships (pp. 25-27), and an institutional framework for sustainable partnerships (pp. 28-34). Relatedly, Whitall (2010) suggests qualitative measures to help the USDA/FS build partnerships. Because partnerships are about relationships that bring public, private, and civic communities together, the author believes that qualitative measures are critical for showing the “breadth and depth” of such relationships. To measure partnership success, Whitall asks

whether the partnership is diverse, whether it is repeatable, how it links to the USDA/FS's mission, and whether it creates abundance (p. 3).

### **Relationship of This Study to The Above Literature.**

As can be seen above, there is a vigorous and ever-growing interest in how to help human beings work constructively together to wisely steward their shared natural resources. There is a recognition that pressing human needs depend on our ability to collaborate, and these needs are likely to intensify with the effects of climate change. Yet there is a clear gap in the literature in terms of getting to the heart of this topic.

There is a widespread belief that collaborative governance is an effective management approach, but the basis for even this fundamental premise is primarily anecdotal and theoretical (Thomas, 2008, p. 2). Much of the available research takes the form of “lessons learned” from non-academic case studies, or studies the social processes employed, not the substantive outcomes (p. 2). Donahue (2004) reflects that “we have essentially no clue” regarding important variables such as the amount of money the government spends on collaborative initiatives, or the extent to which collaborative initiatives impact government decisions, “even in the densely documented United States” (p. 5). Further, Donahue notes, “The official statistics simply aren’t collected or organized with an eye to illuminating collaborative governance” (p. 5). He observes that it is difficult to evaluate “what works” in an area where there is not yet agreement on the definition of phenomenon of interest—that is, collaborative governance—let alone agreement on how one might measure “what works” (p. 6).

Looking at collaborative governance in the conservation arena, McKinney and Johnson (2009) report that there is “general agreement that the promise of large landscape conservation is its focus on land and water problems at an appropriate geographic scale, regardless of political and jurisdictional boundaries” (p. 2). They see regional collaboration as an extremely promising way of filling the “governance gap” when a given policy or management problem does not fall entirely under the jurisdiction of any one entity (p. 2). Yet, McKinney and Johnson point out the scarcity of “both scientific information and knowledge about the structure and function of large landscape conservation initiatives” (p. 3). Kelman (2007) also believes inter-organizational collaboration through public-private partnerships or inside of government is a trend that needs more empirical study and research. He calls for research on why partnerships do or do not work, what skills and mind-set are needed for managers to be effective, and the extent to which public-private collaboration contributes to, or usurps, public action on a given issue.

I found no other scholars who have sought to discern the unique characteristics of landscape-scale collaboration compared to collaboration at other scales. I could find no one looking at this question in the more specific context of forest resources, nor in terms of its implications for anything else, let alone collaborative capacity building strategies. I came across only one researcher who drew upon grounded theory to examine related questions (Williams, 2006); however, this scholar combined grounded theory with several other theories and models. His focus was on developing a mechanism for better integrating theory and practice to generate “actionable knowledge” for use in collaborative public land management (pp. 111, 5-7, 15). His topic is related to this one, but complementary, in that for the present study, I seek to develop theory in one particular area of collaborative public land management (for which this article reports on the first building block, defining the phenomenon of interest).

This study—investigating the unique aspects of collaborating at the landscape-scale in the forest resource management context and the implications for collaborative capacity-building strategies—is a timely undertaking that speaks to an important gap in the literature. The USDA/FS’ CFLR Program reports numerous tangible achievements flowing from the

efforts of collaborators involved in the first cohort of CFLRP-funded projects, as noted earlier in this article. These benefits are compelling to the USDA/FS, participating stakeholders, and elected officials. While evaluation experts labor over the challenge of how to rigorously measure the effectiveness of collaborative governance, those who experience the tangible results emerging focus on how to cultivate more of it. That is the scholarly challenge that drives the present study: how to build interested organizations' respective abilities to use collaboration to achieve shared goals. This article reports on findings pertaining to the first of the study's three research questions: "What is unique about collaborating at the landscape scale on forest resource management?"

## Methods

In conducting this study, I used qualitative research methods rather than quantitative methods or a mixture of the two because I wanted to develop a deep and nuanced understanding of the phenomenon of landscape-scale collaboration in a particular context, rather than to characterize it in broadly-applicable terms (Willis, 2007, pp. 188-189). I employed grounded theory methodology in carrying out this investigation. Grounded theory is the primary qualitative research methodology that enables the researcher to go beyond describing a particular phenomenon to develop an explanatory and/or predictive theory about it (Creswell, 2007, p. 63). Grounded theory scholars tend to study social processes and/or human behaviour (Strauss and Corbin as cited in Creswell, 2007, p. 63). A grounded theory speaks to the processes at work in the phenomenon observed (e.g., stages, steps, or differing reactions to different conditions). Corbin and Strauss (1990) suggest that the purpose of grounded theory research is to produce

A well-integrated set of concepts... that explain as well as describe. It may also implicitly give some degree of predictability, but only with regard to specific conditions... grounded theory seeks not only to uncover relevant conditions, but also to determine how the actors respond to changing conditions and to the consequences of their actions. (p. 5)

There are varying approaches to conducting grounded theory research. I chose to follow the constructivist approach because its proponents believe that researchers "construct" theories that reflect their interpretations of the world as they perceive it, rather than "discovering" an objective truth (Charmaz, 2011, p. 10). The quality of a grounded theory study is judged based on the credibility, originality, resonance, and usefulness of the findings (Charmaz, 2011). Charmaz' ontological views (her beliefs about the fundamental nature of reality) can be considered relativist—i.e., she believes that we create our own realities based on our perceptions and experiences. From her perspective, research should help us understand a phenomenon in context, not to promulgate universal laws (Charmaz, 2011, p. 10). Her epistemological views (her beliefs about how to determine if a statement is true) are interpretivist—in other words, she suggests that we determine a statement to be true if it resonates with our perceptions of reality.

A relativist ontology and an interpretive epistemology fit the study of the social phenomenon at the heart of this study—landscape-scale collaboration. According to Descartes (as cited in Willis, 2007, p. 10), reality is made up of both mentally-constructed aspects and material elements. I view the natural world through a materialist (or realist) ontological lens, and a post-positivist epistemological one. However, I view the social world through a relativist ontological lens, and an interpretivist epistemology. Because this research deals with social interaction (albeit interaction for the purpose of managing aspects of the natural world), I



concluded that a relativist ontology, an interpretivist epistemology, and the constructivist approach to grounded theory methodology that reflects both would be most appropriate for this study.

As one human being studying other human beings, and as a practitioner of landscape-scale collaboration studying others engaged in this activity, I am a part of the phenomenon of interest. In addition, the constructivist's embrace of the past as context for understanding the present fits well with my experience with landscape-scale collaboration; for example, the presence or absence of past conflict over natural resource management decisions on a particular landscape could reasonably be expected to influence the prospects for collaboration on management of that landscape today. My experience with landscape-scale collaboration also gives me an appreciation for its complexities and countless variations; this suggested to me that a less prescriptive methodology might be a good choice, enabling me to tailor the method to the phenomenon. For all these reasons, I discerned a strong alignment between the constructivist school of thought and the nature of this study.

The grounded theory researcher develops theory inductively from qualitative data collected through interviews with between twenty and sixty individuals who have direct experience with the phenomenon. From this data, the researcher discerns key elements of the phenomenon and how those elements interact with one another. Thus, the theory constructed is "grounded" in the data. The researcher analyses the data by coding it in several systematic rounds, with each round growing more general and theoretical, that is, first coding phrases, then categories, and then themes (Glaser & Strauss, 2009). Finally, the scholar identifies the most salient codes (or elements of the phenomenon) and the relationship between them.

Corbin and Strauss (1990, p. 7) explain that the basic unit of analysis in grounded theory is a concept—not the original observation, but what the researcher thinks that observation represents, as indicated through the code or label that the researcher assigns to it. Concepts are then categorized; this goes beyond grouping them, to include definition of the categories' unique characteristics, that is, "dimensions of the phenomenon it represents, conditions which give rise to it, the action/interaction by which it is expressed, and the consequences it produces" as well as variations in how all this plays out (Corbin and Strauss, 1990, pp. 7-8). Eventually, the researcher must commit to a central category that links it all together and "captures the whole shebang" (p. 14). Corbin and Strauss note that it is through such "specification" that categories acquire explanatory potential (p. 12). The theory emerges by showing how these categories relate to each other. The authors also advise analysing how "broader conditions" such as economic conditions and cultural values fit into the theory.

I sought to develop a substantive theory in the area of landscape-scale collaboration on forest resource management. Grounded theories can be divided into substantive and formal theories. Substantive theories focus on a particular context (i.e., collaboration on forest resource management) while formal theory applies to multiple contexts (i.e., collaboration on management of any natural resource; Charmaz, 2011, p. 8). To develop a substantive theory, I needed to look at multiple collaborative initiatives within a particular context. I chose the USDA/FS' CFLR program for a focus because it is a clearly-bounded system relative to other landscape-scale collaborative programs in the natural resource management arena. There have been 23 collaborative projects funded under this program. In searching for an appropriate "set" of these projects for this study, I concluded that focusing on the cohort of ten projects funded in the program's first funding cycle would provide a sufficient number and diversity of projects with which to explore similarities and differences.

## **Research Design**

This study was operationalized in the context of the USDA/FS program known as the Collaborative Forest Landscape Restoration Program (CFLRP). This program was authorized by the Collaborative Forest Landscape Restoration Act, which is Title IV of the Omnibus Public Land Management Act of 2009. The purpose of this program is “to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes” (Schwedler & McCarthy, 2011, p. ii). Congress authorized up to \$40 million per year for 2009 through 2019 and appropriated a full \$40 million for the first year. The USDA now has funded over twenty such collaborative projects, based largely on the input of a Federal Advisory Committee (for which I served as facilitator). All anticipated CFLRP funding has been allocated, and the 15-member Committee is now on “inactive” status.

These are large-scale and complex projects. For the twenty projects selected over 2010 and 2012, the average amount of USDA/FS funding for their first year alone was \$1,103,500 dollars (USFS, 2012). Each project can have up to a ten-year horizon. The average size of the landscapes in which they are situated is 1,105,317 acres. The number of primary stakeholders participating in these collaborative processes at the time of award ranged from 6 to 45, with an average of 24.4. Most of these parties are organizations or agencies, each representing many more people. Primary participants in at least seven of the twenty projects included individuals associated with Native American tribes.

I could have “operationalized” this study in other networks instead (e.g., the US Department of Interior’s Landscape Conservation Cooperatives), but I selected the CFLR network based on my familiarity with it, because research question #2 emerged from my work with the CFLR, because the CFLR program is relatively well-bounded, and because I was deeply embedded in the USDA/FS collaborative capacity building work. I had been helping the USDA/FS develop near-term and long-term agency-wide strategies for enhancing USDA/FS capacity to collaborate with external parties on shared goals, particularly at the landscape scale and across jurisdictional boundaries. The agency recognizes that stronger collaborative capacity is vitally important to the success of a number of strategic initiatives in this austere budget environment (e.g., implementing a new forest planning rule, addressing climate change, integrating the agency’s resource inventory, monitoring, and assessment functions into a cohesive system, and more). My recent work with the agency gave me a solid frame of reference for understanding how to interact with the agency to carry out the proposed research project.

While the rationale for selecting these particular projects as a focus for this study should be clear from the above description, the reader should review the results with the assumption that selection bias is operative. Each of the ten projects studied has up to ten years of funding, and considerable institutional and political support. These conditions can be expected to foster a more positive outlook on the phenomenon of interest (landscape-scale collaboration on forest resource management challenges) than might be expected for projects with less financial, institutional, and political support. A different research design would be needed if one wished to understand the range of views about the merits of landscape-scale collaboration; however, the operative form of selection bias does not confound the findings of this study, given the particular research questions driving it.

### **Sampling and Data Collection**

Sampling and data collection focused on individual telephone interviews and “virtual” focus groups conducted via conference call. I invited all fifteen members of the now-inactive CFLR Federal Advisory Committee to participate in interviews. The fifteen Advisory Committee members guided the launch of the CFLR program. The agency asked these particular individuals to serve on the Advisory Committee based on their knowledge and broad

perspectives on landscape-scale collaboration and their complementary disciplinary expertise. In addition, the agency sought to put together a committee whose members collectively would reflect geographic diversity. In the end, I was able to interview thirteen of the fifteen members of the Advisory Committee, following confirmation that they had each participated in collaborative processes at both the landscape and at least one other scale.

I invited participants in all ten of the Year 1 projects to participate in focus groups, and ultimately was able to conduct focus groups with nine of the ten. CFLRP projects were an ideal universe in which to conduct focus groups because they are, by definition, landscape-scale collaborative projects. The Year 1 cohort of CFLRP projects was selected because, although additional projects had been approved for funding shortly before this study began, they were just getting underway and I was concerned that asking people working on them to participate in this study might be too distracting at such a critical stage of project launch. Moreover, those associated with projects that had been underway for at least 1-2 years presumably were in a better position to share insights about the phenomenon of interest.

To arrange the interviews and focus groups, the USDA/FS national CFLRP coordinator sent an email to CFLRP Advisory Committee members and to the agency's regional CFLRP coordinators to introduce this study to them, convey the agency's interest in the study's results, and encourage their participation. Once this email went out, I followed up with recipients by email and telephone.

**Interviewees.** My follow-up email to Advisory Committee members included an attached invitation letter, which explained the proposed research, the role that I hoped they would play, and asked them to participate. This communication also identified any known risks associated with their participation, noted that the interview would be recorded, and explained how I planned to handle confidentiality. I also attached a consent form, the participant questionnaire, and a confidentiality agreement applicable to an anticipated "member check" conference call (explained below) and asked the recipient to email these back to me within two weeks. I provided invitees with the list of anticipated interview questions to help invitees decide if they would be interested in participating, and if so, to enable them to begin to reflect on their answers.

When a recipient indicated willingness to participate in an interview and returned the completed consent form and participant questionnaire, I reviewed the latter to confirm that the participant met the inclusion criterion of experience participating in collaboration at both the landscape scale and at least one other scale before proceeding to schedule the interview. Two of the fifteen Advisory Committee members did not respond to my overtures.

I arranged for a transcriptionist to be on the line for each interview. (As a precaution, I also taped the interviews using an Olympus digital recorder.) The USDA/FS made a transcriptionist available for this purpose. To arrange for the transcriptionist, I made the request through a USDA/FS liaison. The liaison completed a confidentiality form to ensure protection of the name of the individual being interviewed. In advance of data collection beginning, the USDA/FS liaison also provided to the transcription firm the lists of anticipated focus group and interview questions so that the transcriptionist could familiarize himself/herself with the terminology likely to be used. The USDA/FS provided call-in information for each event, and I then sent it to participants along with a confirmation email. The email reminded participants that the interviews and focus groups were invitation-only events and asked them not to share the call-in information with anyone else.

**Focus Group Participants.** I used a similar approach to organize focus groups, with two added steps. First, I sent an email to each of the USDA/FS' regional CFLRP coordinators associated with the ten CFLRP projects of interest. This email provided further information

about the study and what would be required of participants, including the forms that participants would be asked to complete, and asked the regional CFLRP coordinator to provide contact information for project participants to enable me to follow up with them to invite their participation in a focus group.

Some of the regional CFLRP coordinators responded with participant contact information, while others had questions of clarification (e.g., what constituted a project “participant”), referred me to a co-worker who served as the agency’s project liaison, and/or asked to discuss with me the most appropriate way to convey the focus group request to project participants.

My response to the definitional question was to defer to the agency’s project liaison in terms of what that person considered to constitute a project “participant,” albeit with the clarification that I was interested in the participation of those centrally involved in project-related collaborative processes, not those peripherally involved. I welcomed dialogue with the regional CFLRP coordinators about the most appropriate way to convey the focus group request to project participants, and typically accepted the advice of the coordinator in this regard. The range of ways that the request was conveyed to participants in various projects included:

- I emailed project participants directly;
- The agency liaison emailed the project participants and asked them to contact me if willing to participate in this study; and
- The agency liaison asked the project facilitator, coordinator, and/or chair to help identify who constituted “project participants” in the context of this study.

When an agency representative provided me with contact information for project participants, I then sent the participants for that particular project a follow-up email, explaining the study, asking the recipients to agree to a telephonic focus group on a mutually-convenient date and time, and transmitting the above-referenced forms. The email was sent in a manner that protected the anonymity of the recipients with respect to one another.

For those interviewees who acknowledged the request but declined to participate, the primary reason given was lack of time. Some of the agency’s regional CFLRP coordinators also explained that these first ten projects had been the subject of a number of studies already and some participants were feeling “studied out.” There were a few reports that project participants had had negative experiences with some researchers in the past, which could be affecting their response to the current request; the implication was that at least some of these negative experiences were attributed to the researchers’ lack of understanding of collaborative processes.

Once it was clear which project participants were willing to participate in a focus group for a given CFLRP project, I sent those individuals a link to an electronic scheduling tool known as a “doodle poll” (see [www. Doodle.com](http://www.Doodle.com)) to identify a date and time that would work for most project participants. I arranged for a transcriptionist to be on the line for the focus group.

Ultimately, 13 people participated in individual interviews and 25 people participated in a total of 9 focus groups. Participants included men and women, and individuals of at least three ethnicities (Caucasian, Japanese-American, and Native American). More specific numbers in each category are intentionally withheld to protect anonymity. The geographic base of focus groups included one each in Arizona, California, Idaho, Montana, New Mexico, Oregon, and Washington, and two in Colorado.

The sample size for this study is 22; this sample size is well within the range considered appropriate for grounded theory research. While sample size in grounded theory should be

determined based on theoretical saturation, sample sizes reported as typical in the literature are in the 10-60-person range (Creswell, 1998; Morse, 1994, as cited in Mason, 2010, p. 3; Starks & Trinidad, 2007, p. 1375).

The focus group questions were similar, but not identical to, the primary interview questions. With both, I investigated the same research questions. However, with the focus groups, I did not pre-identify follow-up questions; I did not anticipate having time to pose as many follow-up questions as during the interviews because: a) I anticipated there would be more participants sharing the “air time” in the focus groups, and b) the unique value of a focus group is the opportunity to listen to how several people discuss a particular topic in a relatively organic manner. The other reason for differences in the questions I posed in interviews compared with focus groups is that I asked focus group participants about their insights based primarily on a particular place-based collaborative process in which they all had participated; in the interviews, I asked participants to extrapolate across all landscape-scale collaborative processes in which they had participated.

Two additional reflections on the interview process bear mentioning to illustrate the interpretive and constructivist flavour of the data collection process. Both pertain to how I performed the role of interviewer, and both reflect my work as a facilitator in the forest resource management arena. In my facilitation work, I use the common practice of “active listening,” which involves summarizing the core points that another person has made and checking to confirm that the facilitator’s summary is correct. I used this technique in conducting the interviews and focus groups as well. There were times when, because of my experience facilitating stakeholder dialogue on the issues being discussed in the interviews, I intuited underlying meanings that the interviewee had not articulated explicitly. When this occurred, I explicitly checked those intuitive interpretations with the interviewee through the use of the active listening technique, and consistently received confirmation.

The second reflection concerning my role in the interviews is that, early in the data collection process, there were occasions when I mentioned to an interviewee an observation that a previous interviewee had articulated (without attribution by name) and asked the second interviewee what they thought about that observation. This is an approach that I use sometimes in my facilitation work, both during situation assessment interviews and during group meetings, to stimulate dialogue and identify areas of agreement and disagreement. When I sought academic guidance as to whether this was acceptable procedure, I was told this was probably inserting myself too much into the conversation (as opposed to listening in a more passive, open-ended way). However, in retrospect, I see it as very consistent with a constructivist approach to theory development, in that it explicitly invites “dialogue” among study participants.

## **Data Analysis**

The data analysed for this study took the form of verbatim transcripts of the thirteen interviews and nine focus groups. I typically received each transcript in the form of a document editable in Microsoft Word within a few days following the recorded event. For each transcript, I conducted two rounds of review for quality control purposes. I first reviewed the written document and corrected obvious errors caused by the transcriptionist’s lack of familiarity with natural resource management. I then listened to the audio-recording and corrected additional errors as necessary.

To discern nuanced insights pertaining to the research questions, I then conducted the qualitative data analysis steps on the transcript texts suggested by Charmaz (2011, pp. 42-71). This coding approach occurs in three primary steps—initial and focused coding, axial coding, and theoretical coding. In carrying out the coding function, I engaged in “constant comparison”

(Glaser & Strauss, 1967, as cited in Charmaz, 2011, p. 54). This refers to the continuous scrutiny I gave to the data to ensure that I was assigning codes appropriately and consistently, both within a particular transcript and across transcripts. I searched for the essence of each text passage to code. At each successive level of coding, the codes become a bit more generalized as I searched for patterns, categories, and themes. Thus, as I moved through the three levels of coding, I had to look back upon the material already coded and occasionally adjust codes if I had come to see in retrospect that the true essence of a statement lay in a different aspect of the statement than initially thought. Due to the volume of text coded for this study (over 1,000 pages of transcripts), the constant comparison process was extensive and time-consuming.

In initial and focused coding, I went through the text line-by-line, approaching the data with an open, spontaneous attitude. I kept in mind the research questions as reference points and considered what phrases in the data pertained to those research questions; these phrases became “initial and focused” codes. I ensured that each section of text assigned an initial and focused code had its own identifying label to maintain an audit trail. At this stage, I coded in a fine-grained manner to preserve detail and facilitate the constant comparison process and used phrases for the initial and focused codes that came from the transcript (“in vivo” coding). Also, following Glaser (as cited in Charmaz, 2006, p. 49), I used the gerund verb tense for initial coding (e.g., “nominating” rather than “nomination”) which helped me preserve the insider view, action, and sequence. I recorded all codes in “comment balloons, a function offered in Microsoft Word software.

I then combed through the data a second time, engaging in “axial coding” (Charmaz, 2011, pp. 57-60). Axial codes are those that help the scholar integrate and make sense of larger sections of data than single lines or comments (e.g., a key element or phase of the subject being studied) or a category that encompasses a cluster of initial and focused codes. I kept the number of axial codes to a minimum to make analysis manageable.

The final coding stage is that of theoretical coding (Charmaz, 2011, pp. 63-66). This involves stepping back and considering which code(s) represent the “heart of the matter”—the code(s) that convey the key conceptual category(ies) around which the remaining codes can be organized. Theoretical coding explains the relationship between categories of codes (e.g., between axial codes).

Theoretical coding is the point at which the scholar is exploring relationships that can be used as the basis of hypotheses and generating his or her substantive theory (Glaser as cited in Charmaz, 2006, p. 63). The researcher provides a rationale for his or her emerging theory, illustrating it with quotes from the initial and focused codes. Finally, the researcher creates a visual diagram to illustrate the theory.

I first analysed each transcript with respect to the participant’s answers to Research Question 1 first; I then repeated the analysis of participant answers to Question 2, and finally for Question 3. I worked on both initial and focused coding and axial coding of a given transcript (for a given research question) concurrently to help me efficiently identify categories in the initial and focused codes.

After following the above steps for all 22 transcripts with respect to a particular research question, I identified theoretical codes associated with that particular research question. To assist in discerning these theoretical codes, I created two tables—one for the interview data and one for the focus group data for that particular research question—in which I displayed all the initial and focused codes, as well as all the axial codes, by transcript and by comment balloon number. I then made a single combined coding table and a single combined code inventory for each research question, drawing from all 22 transcripts. These tables and code inventories were invaluable to the constant comparison process, enabling me to notice oddities in the data such as redundancies, gaps, or inconsistencies across transcripts and/or between the sets of transcripts associated with focus groups compared with the set of transcripts associated with

interviews. I employed constant comparison within a given transcript, as well as across transcripts, to arrive at a set of initial and focused, axial, and theoretical codes that collectively provide a coherent framework for all the transcripts.

Further, the comparison of axial codes emerging from the interviews and those emerging from the focus groups represents an important form of quality control for this study, that is, triangulation (Flick, 2008, pp. 43-44). In triangulation, the researcher uses multiple research methods and compares the results obtained from each. In this way, the researcher can either confirm that the various methods generated similar findings or uncover and explore divergent findings. In this case, I triangulated using interview and focus group data.

## **Theory Construction**

The volume of transcripts (over 1,000 pages) and coding data generated in this study was immense. The tables described above were indispensable tools by which I managed the sheer volume of data and helped me make meaning of it. In particular, the combined table of axial codes was instrumental in enabling me to notice the patterns that pinpointed the theoretical codes associated with each research question, which ultimately drove the substantive theory that emerged from this study. For each research question, I identified primary and secondary theoretical codes pertaining to that research question.

As I completed the above steps for a given research question, I wrote a narrative describing the insights that participants collectively had offered in response to that question. In so doing, I drew upon the memos I had made during the preceding coding steps, compiling all memos associated with that particular research question and integrating them into the narrative.

Once I had completed narrative descriptions of participant responses related to each research question, I explored the relationships between the theoretical codes associated with each research question in order to formulate substantive theory regarding how interested organizations might best approach the task of strengthening their respective capacities to collaborate at the landscape scale on forest resource management. I employed both “right brain” and “left brain” techniques to stimulate my creativity in this regard and deepen my theoretical thinking. I reviewed the numerous axial and theoretical codes generated through this study to discern the most compelling theoretical codes, reviewed memos I had made throughout the coding process, created a table of theoretical codes for potential use as theoretical building blocks, and created a graphic to depict key relationships between those theoretical building blocks.

After completing the above data analysis steps and generating the central theories emerging from this research, I undertook another important quality control step known as “member checks.” Member checks refer to the practice of sharing emerging findings with co-researchers (e.g., interviewees and/or survey respondents) to invite their assistance in interpreting the results (Flick, 2008, p. 66). In this study, I used member checks to further enhance the validity of my findings by conducting a webinar for research informants (interviewees and focus group participants) to share with them the preliminary findings from this study and seek their feedback. I convened a “member check” conference call/webinar via the “Live Meeting” technology. All interview and focus group participants were invited to participate, and I circulated a “doodle” poll to them to pick a date and time that would work for the maximum number of interested parties. Three individuals actually participated. I used PowerPoint slides to present the proposed theory to participants, pausing at key points to invite feedback. The call was audio-recorded, and a transcript produced for later analysis.

Participants enthusiastically affirmed the findings from this study regarding the characteristics that make landscape-scale collaboration unique compared to collaboration at other scales. They also concurred with this study’s characterization of the challenges associated

with landscape-scale collaboration on forest resource management. They identified three additional challenges faced by USDA/FS personnel managing CFLR projects and made several suggestions for ensuring the study would be as useful and accessible to landscape-scale collaborators as possible. I incorporated all these suggestions into the final work product.

## Findings

This section is broken into two topical parts. The first part illuminates the way in which respondents define the “landscapes” upon which they work in doing landscape-scale collaboration. The second part describes the characteristics that, when taken as a whole, give landscape-scale collaboration its “distinctive flavour” compared to collaboration at other scales. Within each of these two parts of the Findings section, I identify qualities of the focal phenomenon, provide supporting data, and conclude with an analysis of what the findings tell us. Please see the Discussion section for reflections of how these findings relate to others’ scholarship.

### How Participants Define the “Landscape” in Landscape-Scale Collaboration

Analysis of the interview and focus group data emerging from this study suggests that the boundaries of the landscape that will be the focus of “landscape-scale collaboration” are determined contextually based on two categories of variables. These include: 1) attributes that are inherent in the natural environment (referred to henceforth as “the lay of the land”) and 2) a variety of human dynamics. I discuss each of these categories in more depth below—the variables included in each and data supporting this framework.

**The Lay of the Land.** Variables inherent in the natural environment that help define the boundaries of a focal landscape include landform, hydrogeography, ecosystem, and size. Data supporting the inclusion of each of these variables as components of the category “Lay of the Land” follow.

*Landform.* The term “landform” refers to participant remarks about the physical shape of the environment, such as a mountain range. For example, Interviewee #9 said, “In another project with which I was involved, the landscape was actually defined as the mesa top.”

*Hydrogeography.* The term “hydrogeography” refers to participant remarks about the flow of water through the landscape, such as a watershed or river. Interviewee #4 observed:

... I think it really is more dependent on what the ground actually looks like -- what are we really talking about. And if it doesn't meet that 50,000-acre threshold, but it's a very unique, let's say, watershed environment that's less than that, fine. And also, conversely is true -- if it's larger than that, that's okay, too. I think it's more dependent on the actual lay of the land than it's on an arbitrary number.

*Ecosystem.* The term “ecosystem” refers to plant and animal communities living in a particular physical environment. A Colorado Front Range focus group participant said, for instance, “... for the purposes of the Front Range CFLR, it was defined as the area that takes in the lower montane zone.” The physical environment includes soil type and “aspect” (i.e., position of the landscape relative to the sun, wind, and precipitation).



Respondents suggested that a landscape is both ecologically diverse and has cohesion to it. For example, Interviewee #11 said that a landscape "...is a sort of a contiguous, manageable ecosystem, that's altogether its own thing—whether it's a watershed, or a particular forest type..."

However, there appears to be a dynamic tension between the cohesion of a landscape and its internal diversity, and the way in which this dynamic tension manifests in any given landscape seems to vary by geographic region. Interviewee #9 observed, for instance, that:

In the western states, there are large, large areas of National Forest that are also reasonably homogenous ecologically—the same kinds of forest over a very large area, or maybe two forest types. In the eastern United States, National Forests are much smaller and the forest types are more highly variable. These forests are much more patchy; there are more forest types.

This interviewee noted that forest management is tailored to forest type, and thus forest type (one aspect of an ecosystem) should be a key consideration in defining a landscape for purposes of forest resource management.

*Size.* The way in which landscape size factors into the delineation of a landscape's boundaries is contextual. See, for example, the comment of Interviewee #8 that,

[Someone I know] says that if you're not doing something at the 100,000-acre level, you're wasting everybody's time and money... that it's not significant—that you can't have a significant ecological impact. To me, that view completely ignores the social process.

What is a reasonable size for a focal landscape varies by geographic area of the country and relatedly, ecosystem type. For instance, Interviewee #7 said:

In Southeast Alaska, in the Tongass, ...we have an island geography ecosystem... you can get up to 50,000 acres, but there are other areas that are geographically isolated and smaller, so I think that's a little bit of a difficult and arbitrary number for my reference. And I think it just really depends on where you're working and ... who you're working with. And there's a combination of sort of the ecosystem boundaries and.... ecological boundaries as well as community use.... (Interviewee #7)

In defining the boundaries of a focal landscape for purposes of a collaborative process, there may be an upward size threshold for what is optimal. This is illustrated by the words of a participant in the Deschutes Focus Group:

If I'm thinking about collaborating on the land itself, then that "landscape" could be anywhere from 15-20,000 acres up to several hundred thousand acres. If I think of just "the landscape," it's really difficult—you can't collaborate, but you may be able to apply certain things from the smaller landscape (that you **can** collaborate on) to a much bigger landscape of millions of acres with similar forest types...

Many landscape-scale collaborators differentiate between the size of the area considered while **planning** a forest management intervention and the size of the area on which the intervention

actually occurs. According to Interviewee #8, the “planning area” is often larger than the “implementation area” by a factor of two or three. For managers who are seeking to restore ecological integrity to a landscape, examining a larger planning area enables them to select the portion of the landscape where intervention would be most helpful, to factor in how ecosystems adjacent to the focal one (and associated human uses) might be affected by their actions, and to consider cumulative effects. Interviewee #8’s comment underscores the point that the boundaries of a particular landscape must be defined in context.

The concepts of landform, hydrogeography, ecosystem, and landscape size are inherently inter-twined. The shape of the physical environment is a major determinant of how water flows through it. In turn, the way in which water flows through an area is a major determinant of the kinds of plants and animals that will be able to survive there, and the size or extent of any given forest type within the local ecosystem. Since forest managers seeking to restore ecological integrity to a particular landscape generally do this by carrying out “treatments” tailored to particular forest types, this combination of factors in turn informs the ways in which humans may relate to that particular landscape.

The Uncompahgre Plateau illustrates the close relationship between these key concepts, and how they may jointly inform the boundary of a “landscape.” A participant in the Uncompahgre Plateau focus group explained that the boundaries of this landscape reflect transportation corridors in the area, which each lie along one of four valleys. These valleys are the “low point demarcators of the Plateau.” According to this respondent,

It makes sense because that's where the land starts to rise and starts taking on a different biotic character where you start seeing transition from, you know, more of the agricultural lands into more of the, you know, non-developed vegetation types—from sagebrush going up to, finally, the alpine. So the Plateau itself is a pretty distinct geographic land form, anyway. And so, I think that kind of just made sense to draw that boundary around it.

*Analysis.* Landscape-scale collaborators faced with delineating a landscape for management of forest resources thereon consider numerous factors in setting the boundaries of the landscape with which they will work. In this part of the Findings section, I have focused on one of two clusters of such factors, that is, those inherent in the natural environment. This cluster of variables includes landform, hydrogeography, ecosystem, and size. Of these, ecosystem seems to be the driver, particularly since managers in this study were focused on ecosystem restoration. Landform and hydrogeography are major influences on the type of ecosystem that is found in any particular place. Size of the selected landscape is then a question of the extent of the ecosystem that the manager seeks to restore, along with the distribution of the forest types encompassed by that ecosystem; this can be expected to vary by geographic area of the country and ecosystem type. The manager may take a larger sweep of land into consideration during planning stages relative to the size of the landscape on which the manager undertakes collaborative restoration activities; this makes collaboration more feasible, while still allowing participants to consider the broader context and consequences of their actions.

**Human Dynamics.** The preceding part of the Findings section reports findings of this study pertaining to one of two categories of variables influencing the boundaries of the landscape that will be the focus of “landscape-scale collaboration” (i.e., attributes inherent to the natural environment). However, as Interviewee #13, points out, “... the collaboration part (of ‘landscape-scale collaboration’) is people working together on common goals.” Accordingly, the next part of the Findings section will report on findings related to the second category of variables that influence such boundaries—human dynamics.

Given the centrality of “people” to the phenomenon of study (landscape-scale collaboration on forest resource management), it is not surprising that characteristics and needs of the “people” involved in, or affected by, landscape-scale collaboration would shape their perspectives on the boundaries of the “landscape” on which they seek to collaborate. Pertinent considerations include social and cultural variables, community use and economic variables, and political and jurisdictional variables. Data supporting the inclusion of each of these variables as components of the “Human Dynamics” category follow.

*Social and Cultural Variables.* In this context, “social and cultural” variables pertain not only to how humans interact with each other, but how they interact with natural resources in a particular area. This includes their relationship to nature in a particular locale in the past, in the present, and what they hope it will be in the future. All these variations may influence what present-day humans value about the land, those parts of the area that are particularly important to them, and hence the boundaries of a landscape on which they may choose to collaborate. The following quote from Interviewee #10 reflects a relationship that includes past, present, and future components:

In our community, we're part of the land. We have been a part of this place. When you talk about time, I think it's really important that, as a tribal community, and as a tribal member, we just don't pick up and leave. We're a part—and our ancestors, and our way of life and our culture and everything—is tied to this place. How we interact and the things that we value are linked greatly to our forest, to our water, to those natural resources.... When you talk about the place and time and the policies that have come through—the treaties and the federal government and the land being shifted for other purposes—we've continued to be where my people have walked and where I plan to be a part of this and the role that I play as the tribal government and trying to guarantee that the land that was left to us, it's still in place after we leave. That we leave it in a way that can continue on forever, and in many contexts, to provide those things with our relationships to the Creator and who we are as a ... people.<sup>3</sup>

The natural resource management goal that motivates stakeholders to work together also can be thought of as a social and cultural phenomenon that informs the boundary of a focal “landscape.” This speaks to the form that collaborators hope the area’s natural resources will take in the future, and perhaps the future relationship that collaborators hope to have with nature in that area. The following quote from Interviewee #6 illustrates how participants factor their management goals into the boundaries of the “landscape” they are working on:

It can be just geographic, depending on the species in question that you're trying to modify the habitats for, or for a group of species... I'm looking at about 5,000 acres or more, or in general, in looking at what I would consider geographically large-scale landscape acreage. But it's also dependent... on just the acreage and how the surrounding area would be—like a mountain region or valley—where you're trying to accomplish certain types of habitat management that would impact certain species or a species.

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<sup>3</sup> Tribal name omitted to protect confidentiality.

Several of the landscape-scale collaborative initiatives that were included in this study considered existing social capital in setting the boundaries of the landscapes on which they would collaborate. This took the form either of some past administrative undertaking (such as a previous resource inventory) that would afford valuable data for the collaborative effort, or past collaborative work in the area, which had established a network of positive relationships and collaboration experience upon which to draw in convening the new collaborative process.

The existence of agreement on the area needing restoration constitutes another aspect of social capital that informed boundary-setting for three projects. If such an agreement already existed when the collaborators were considering where to focus their efforts, it would reduce the transaction time needed before collaborators could really get out in the field and get their restoration efforts underway on the ground. Several respondents mentioned that, as the collaborative participants made progress on their original restoration goals and they reached agreement on additional areas needing restoration, the boundary of the focal “landscape” changed to reflect the expanded agreement and encompass the new areas.

Such agreement on boundaries at the outset of a collaborative initiative is not necessarily the norm. One focus group (the Uncompahgre Plateau) reported varying perspectives of where their landscape’s boundaries lay as a known social fact: “The boundaries of the Uncompahgre Plateau have always been subject to a variety of definitions.” The focus group did not attribute a temporal dimension to these variations, but rather implied that the variation was due to the use of a diversity of landscape-defining reference points by different parties in different contexts. For example, one participant in this focus group said: “When people talk about the Plateau, they also may be referring to the landownership and the jurisdiction that they have management authority over and not necessarily the entire Plateau.”

Another focus group indicated that their collaborative participants had considered, but rejected, the idea of simply accepting boundaries used in the past: “We had lots of local discussion about where the boundaries of our selected landscape lay, rather than adhering to previously-designated boundaries” (SW Crown Focus Group). This reference to making boundary-setting decisions based on “lots of local discussion” points to the question of who makes this decision—a phenomenon referred to here as “definitional power.” In one case, the respondent said that the boundaries had been set unilaterally by the USDA/FS. However, in most interviews and focus groups where participants brought up definitional power, they said that the boundaries had been decided by agreement of the collaborators. Almost all interviews and focus groups mentioned multiple variables that informed the boundaries of their landscapes, which seemingly implies that significant explicit thought and discussion usually goes into setting the boundaries of the landscape upon which many entities will agree to collaborate.

*Community and Economic Uses.* One of the aspects of the CFLR Program that makes it successful is that it encourages forest restoration in a manner that contributes to the local economy and job creation. Rather than accepting as inevitable the polarization between the environmental community and the forest industry that arose from the “timber wars” of the 1980s and 1990s, the CFLR Program offers a way for both major social sectors to get their needs met far better than they could do acting independently. The following quote from Interviewee #12 regarding New England’s Wildlands and Woodlands initiative illustrates how landscape-scale collaborators may consider economic factors in determining natural resource management strategies for their focal landscapes:

The most important spots are protected, but there are large areas of land connecting them, and with things like climate change and ecological processes moving on, much of that is in private hands and you know, how do you protect that going forward? And much of that will be kind of the working forest

landscape. And so, there is an importance of generating economic returns to private landowners to ensure that they have an interest in maintaining their forest....

Community and economic uses of a landscape represent inter-related dimensions of the “people” factor that may go into decisions about where to draw the boundaries around a focal landscape—in other words, the way in which local communities currently interact with the landscape. This includes, for example, popular recreation areas, traditional ceremonial sites, and subsistence hunting and fishing. The following quote illustrates how the subsistence needs of a community may affect the boundaries of a landscape on which collaborators will focus:

Community use is a big thing in Southeast Alaska, and particularly with Alaska Native communities—where they hunt, fish, subsistence.... So you’ve got a lot of small native communities and villages that are really dependent upon the resources of their public land. So how they define their boundaries and how local people use the land is also pretty relevant to our sort of collaborative work... The local people’s subsistence needs inform where you might go... (Interviewee #7)

*Political and Jurisdictional Variables.* Political and jurisdictional considerations represent a somewhat more institutional, but no less important, example of the “people factors” that commonly help shape the boundaries of what we perceive as a “landscape.” In terms of political considerations, Interviewee #11 says:

On the political side, it seems to me that the landscape-scale collaborative tends to kinda be an optimum level. You’re not so big that you get a lot of political interference. You can get some political help, you know, the local Congressman or local Senator may be watching, or maybe trying to help. So on the national scale, you got a lotta cooks in the kitchen... how to make the gumbo. And on a really local scale, usually, like a project-level scale, sometimes there’s no politics or if it is, there’s just some of the local folks who then tend to be looking at, “I just want jobs. I don’t know about what you mean, restoring the forest long-term,” you know, and so... when you get to the landscape-scale, you can bring the local politicians into a bigger view of “well, if you restore this long-term, you have more jobs long-term.” You can bring some state and national politics to play that would help, but often in my experience, didn’t interfere. But when it’s regional—multi-state—or often national, then I start to see politics interfering more than it helps sometimes. So a landscape-scale collaborative, to me, kinda hits the sweet spot, where you can get enough politics involved that it helps, but it doesn’t hurt you yet.

Cities and counties were often named as reference points by respondents describing the location of the landscape about which they were talking. The data suggests that the larger the landscape, the more likely it will include mixed ownership patterns. For example, Interviewee #8 said: “...The acreage is quite significant, so there they’ve been looking at the watershed, not just the Wallowa-Whitman National Forest. In that case, there’s also been work on private land. It’s been more of a mixed ownership landscape” (Interviewee #8).

Another way that respondents mentioned political jurisdictions was in talking about the importance of undertaking restoration work in the “Wildland/Urban Interface,” or “WUI.” This is important because the extreme wildfires that are increasingly frequent as a result of decades

of fire suppression are far more likely to cause catastrophic loss of life, property, and livelihood if they occur in areas adjacent to populated areas. Thus, doing forest restoration work (which typically involves removing the kind of vegetation that fuels forest fires) in the Wildland/Urban Interface may reduce safety risks more significantly than doing forest restoration work elsewhere. See, for example, the following quote:

We also picked it because it is the major part of the Wildland/Urban Interface. In other words, where the towns and the people butt up against the forest or actually live in it, in subdivisions and inside, on some private land. So if we're covering that area, then the next logical thing would be to go, "Oh! We still -- The next town to the south is Sun River, and then La Pine, and there's a hole at Sun River" ... There's a town there, so it made sense to say, "Oh! We'll just add onto the south" ... And then, that's where the fires come from, is up high, and come down toward the Wildland/Urban Interface. So it made sense to add that area. It's important to focus on the Wildland/Urban Interface, mainly the connection to the fires, 'cause we've had quite a few. I mean they're natural fires burn here—usually starts to come over the crest of the Cascades, and then the prevailing winds—they blow to the east basically, but sometimes a little northeast, sometimes a little southeast. And so the fires come down towards the towns and cities, which are usually just on the edge of the forest, so it made sense. And then, also, there's various private lands—inholdings—and a lot of those have been developed, either into destination resorts or just housing developments that are surrounded by National Forest. So a huge number of the people that live over in this area are in that zone and [indiscernible] several different fires that'd come down, and they would be potentially threatening those towns' subdivisions, so it was like, "OK, let's put some emphasis there because it makes sense to do restoration work and try to ameliorate for potential fires, where the people and their houses are." So that became a priority. (Deschutes Focus Group)

A number of respondents mentioned that they sought to set their "landscape" boundaries taking many things into consider in a holistic manner and noted that a landscape often transcends jurisdictional boundaries. Nevertheless, land ownership, affected jurisdictions, and maps were mentioned by many respondents as they talked about the considerations that helped to shape their landscape boundaries. They didn't ignore jurisdictional boundaries, but rather worked proactively to engage relevant jurisdictions in the collaborative effort. See, for example, the following quote from a participant in the Tapash Focus Group:

It includes land of the five signatory land administrators that belong to the Tapash Collaborative—the Forest Service, the Yakama Nation, The Nature Conservancy, and two Washington State agencies—the Department of Natural Resources and the Department of Fish and Wildlife.

*Analysis.* Along with factors inherent in the natural world, landscape-scale collaborators draw upon a variety of human considerations in defining the boundaries of the landscape on which they will collaborate. Collaborators tend to spend a lot of time talking through the various factors, seeking to make this decision in a holistic way. They consider, but are not bound by, political and jurisdictional boundaries; their focal landscapes often span multiple jurisdictions, with all those jurisdictions represented in the collaborative effort. The boundaries of the particular "landscape" that will be the focus of a "landscape-scale

collaborative process” are defined within a particular social, cultural, economic, and ecological context, taking numerous variables into consideration. Most frequently, it is done through extensive discussions among the collaborators. In so doing, the collaborators reflect upon the entire vista, looking for the “sweet spot” —an area appropriate to the management goal that drives the collaborative effort (e.g., the need for forest restoration and fire risk reduction)—an area that is “a contiguous, manageable ecosystem, that’s altogether its own thing” (Interviewee #11). As the Tapash focus group observed, a landscape is defined by... “looking across the entire land, without the political boundaries.”

### **Distinct Qualities of Landscape-Scale Collaboration**

The above findings address variables that help us define the boundaries of the landscapes upon which we wish to collaboratively manage forest resources. This portion of the Findings section focuses on defining landscape-scale **collaboration**: that is, characteristics that make it different from collaboration at other scales. I found five themes in study participants’ responses to the question, “What makes landscape-scale collaboration on forest resource management distinct from other forms of collaboration?” These include: (1) the ability to work at a scale appropriate to the ecological systems that collaborators are trying to restore; (2) functioning as a “sweet spot” for achieving impact; (3) a high degree of scientific uncertainty; (4) the need for self-governance mechanisms; and (5) a counter-intuitive link between investing in relationships and maximizing efficient progress. In this portion of the Findings section, I define each of these characteristics and provide illustrative transcript excerpts. The section concludes with an analysis of what these findings tell us. Please see the Discussion section for reflections on how these findings relate to others’ scholarship.

**Ability to Work at a Scale Appropriate to the Ecological Systems that Collaborators Seek to Restore.** The landscape scale allows participants to look at the natural resources they seek to manage in a holistic manner, both temporally and spatially. They can look over the entire vista, consider how the components of the natural systems fit together, what is needed to restore them to balance, and consequently, choose an appropriate focus for their efforts. Participants report the utility, efficiency, and satisfaction of being able to work at a scale appropriate to the system they are trying to change. This point is illustrated by the following quote from a participant in the SW Jemez Focus Group:

The benefit to landscape level work... (is) it's a skill you have to (have) to actually deal with the .... ecological processes of concern, which in our case is definitely fires. It's a really critical process, and you can't really address it without working at a scale that's relevant to how that process works.

**Functioning as a “Sweet Spot” for Achieving Impact.** Working on such a large scale is challenging but affords an opportunity for correspondingly large positive impacts. Participants said that landscape-scale collaboration represents the “sweet spot” with respect to participant knowledge and commitment, politics, and efficiencies of scale. By “sweet spot,” I mean a particular configuration of circumstances that maximizes problem-solving traction. The commitment seems to originate from a love of the place, as illustrated by the following comment by Interviewee #10: “People that are actually tied to the land bring passion and have the granularity of what goes on there or does not.”

With respect to participant knowledge, respondents said that at the national level, participants tend to know about policy, but are less intimately familiar with the natural resource they are trying to manage; conversely, at the local level, participants tend to be very familiar

with the resource itself, but not very knowledgeable about applicable policy. However, at the landscape-scale, participants tend to be knowledgeable about both the resource and applicable policies. See, for example, the following quote from Interviewee #4:

The beauty of what place-based landscape scale collaboratives do (if they're done right) is that there's an awful lot of ... peer-to-peer learning that goes on. And so, one of those things may get started (and they get going in a whole variety of different ways) where you do have that situation of the policy versus the resource knowledge. As they begin working together; I've seen that that gap really closes. Now people can talk policy and resource around a table and have a pretty good idea of what they're talking about. And they can also talk about it from each other's point of view

A similar point was made regarding political assistance (i.e., that at the local level), political involvement tends to be focused on parochial interests such as maximizing job creation. At the national level, political involvement can feel like interference to help the politician achieve a big-picture goal. However, landscape-scale collaboration tends to attract forms of political involvement that further the collaborative goal.

Moreover, landscape-scale collaboration offers efficiencies of scale in that participants can pool their resources to maximize traction in accomplishing mutual goals. One of the stages at which this is particularly evident is when participants shift from building consensus on what they want to do into implementing that vision on the ground. This typically requires environmental analyses to comply with the National Environmental Protection Act. When working at the landscape-scale, such analyses can potentially be done much more efficiently than normal by bundling multiple related projects together for purposes of conducting these environmental analyses. One study participant also mentioned that landscape-scale collaboration can illuminate broadly-applicable "zones of agreement" upon which resource managers can rely in making subsequent decisions applicable to large geographic areas.

In addition, for those who participate over the multi-year timelines of landscape-scale collaboration processes, the relationships they build reinforce their mutual commitment to shared goals. This is reflected in the following comment by Interviewee # 11, who said that, relative to project-level collaboration:

The (stakeholder collaboration process at the landscape scale) also seems to me to be kind of a sweet spot - where you can get people involved who are willing to give some long-term commitment to the process. Therefore, they become more knowledgeable and share their knowledge more, and become involved more long-term...

**High Degree of Scientific Uncertainty.** Landscape-scale collaboration involves a large geographic area. The level of scientific uncertainty regarding the current condition of the resources over such a large area, and the most effective way to attain the desired future condition, is very high. See, for example, the following quote:

In this process, we don't have the answers, and a lot of people don't have the information, and we don't have, even, competing opinions! We just don't **have** answers. And so, instead of that process of getting everybody's ideas out, it's that we're launching many different research efforts. So ... there are (seven) subcommittees that are ... trying to come up with ... recommendations (on) how to do monitoring on a landscape level. And so, it's much more of a research



approach, and a “wait and see.” We know it’ll be a couple of years before we have answers... (Colorado Front Range Focus Group)

Thus, research plays a more central role in mapping the path forward than in project-level collaboration. It takes a long time to gather existing information about all the resources involved, let alone obtain the results of original research undertaken to answer specific questions raised by collaborators. This means that the temporal planning horizon is very long, and adaptive management plays a central role in determining how best to proceed.

**Need for Self-governance Mechanisms.** In the collaborative processes that are the focus of this study, one entity may have organized and convened the parties, but typically no single entity has the power and authority to make decisions on behalf of all the collaborators. If collaborators are to work productively together over a period of years, they need to develop a set of procedures for decision-making and carrying out their work that is acceptable to all to whom they apply, that is, self-governance mechanisms. Typically, these procedures are documented in a charter, and rely upon consensus-based decision-making. See, for example, the following quote:

The other thing is the whole governance question. And that’s, how do these groups really govern themselves? In a typical Forest Service public involvement type of a process on a NEPA project, they really don’t have to be terribly committed to things. They’re being asked for information; they’re providing information and so on. The place-based collaboratives are a whole different animal because there’s no one particular lead dog, necessarily. But they agree to be self-governing groups. And so that whole exercise in governance and how that’s exercised among them is a very, very interesting process. And it takes all different shapes, sizes, and forms. It’s an interesting process because what it does is it makes the individual participants have skin in the game, because they’re now a part of the governance process. (Interviewee #4)

**Link Between Investing in Relationships and Maximizing Efficient Progress.** While relationships are arguably central to most forms of collaboration, they take on extra importance when working at the landscape scale for two reasons. First, as mentioned above, landscape-scale collaboration tends to stretch over a long period of time—i.e., measured in years, not days or months. Continuity of involvement is important to making progress, so that agreements can be negotiated and upheld, and topics need not be rehashed repeatedly. The following quote illustrates the relatively deep cross-sector relationships that participants cultivate over these multi-year processes:

Most of my best relationships with Forest Service people and industry people have come through these landscape-scale collaboratives, these long-term restoration projects that we’ve done, either on a forest-wide or—like longleaf pine—as ecosystems... the people I know that I can trust implicitly, that I know I’m going to go have a beer with, without even asking—they’ll wanna go have a beer with me—are folks that I went through these landscape-scale collaborative experiences with... You also have a lot more smaller meetings—the members of the collaborative getting together sometimes—just, you know, the enviro guy and the timber guy, just going out together to go talk about things and look at things, and so you have meetings and development of relationships

among the members as well, where on these national level things, you don't have that. (Interviewee # 11)

Second, participant alignment around an agreed-upon focus is important if they are to make progress, rather than spreading their efforts over too many objectives. Respondents pointed out that the more participants trust and understand one another, the better they can stay focused on particular goals rather than pursuing tangential issues. Thus, they collectively articulated the importance of taking the time to invest in building trusting relationships. They said that the time invested in doing so will ultimately pay off in an ability to work more efficiently together on shared goals. A participant in the Southwest Crown of the Continent Focus Group) emphasized this point in saying, "...That's so critical because it speeds up the process so much if you develop that trust and relationships, and it takes a long time to do that.."

*Analysis.* Reflecting on this study's interview and focus group data as a whole, leads me to hypothesize that collaborating at the landscape scale on forest resource management affords remarkable opportunities for efficient use of resources to achieve ecological, social, and economic restoration. It engages the whole person, offering transformative experiences. Working on the landscape scale seems to be an optimum scale for attracting constructive political assistance in getting things done, as a landscape encompasses sufficient resources to meet a variety of needs, from ecological to economic; further, because it focuses on an identifiable "place," it attracts those with both knowledge of that place and an emotional investment in it. Five characteristics, taken together, convey what makes landscape-scale collaboration different from other forms of collaboration: 1) the ability to work at a scale appropriate to the ecological systems that collaborators are trying to restore; 2) functioning as a "sweet spot" for achieving impact; 3) a high degree of scientific uncertainty; 4) the need for self-governance mechanisms; and 5) a counter-intuitive link between investing in relationships and maximizing efficient progress.

These characteristics are inter-related. The primary motivations for the landscape-scale collaborative initiatives that are the focus of this study are forest ecosystem restoration and thus, reduction of catastrophic forms of wildfire. Collaborators seek to understand the drivers of these ecological systems to restore their functionality. If they can do so – and work at the same scale on which those ecological systems operate—collaborators have the opportunity to gain significant traction and achieve maximum positive impact with respect to their management goals (healthier forests, fewer wildfire catastrophes). However, because forest ecosystems are a large-scale phenomenon, landscape-scale collaboration for this purpose involves a large geographic area. Because collaborators seek to manage large geographic areas, there generally is a correspondingly higher quantity and variety of natural resources and ecological interactions to understand to manage them effectively. Thus, collaborators typically face numerous scientific questions for which they lack answers (i.e., high scientific uncertainty).

Due to the high levels of scientific uncertainty associated with landscape-scale resource management, research plays a more central role in mapping the path forward than in project-level collaboration. It takes a long time to gather existing information about all the resources involved, let alone obtain the results of original research undertaken to answer specific questions raised by collaborators. This means that the temporal planning horizon is very long, and adaptive management plays a central role in determining how best to proceed. Because the collaborative initiatives must operate over long periods of time (e.g., years, and possibly decades), self-governance mechanisms are needed to help sustain the collaborative organization or group. Faced with such a big challenge, widespread American values tend to favour "rolling up one's sleeves and getting down to business"; however, this study suggests

that collaborators will be better able to realize the potential of the “sweet spot for maximum impact” associated with landscape-scale collaboration if collaborators invest time upfront in getting to know one another, building interpersonal relationships, and developing agreement on shared goals.

## Discussion

This article makes two primary contributions to collaborative governance scholarship in the forest resource management arena. First, with respect to landscape-scale collaboration, this article elucidates the factors that practitioners consider in setting the boundaries of their focal landscapes. Second, it offers a definition of landscape-scale collaboration in the forest management context. Both are discussed below relative to others’ scholarship.

### Framing the Focal Landscape

Innes and Booher (2010) make the point that harvesting the maximum benefit from collaborative efforts is a function of how operational details are handled (pp. 89-117). Perhaps the most fundamental such detail is defining the key terms that shape the program. This study shines a light on the definition of the term, “landscape-scale.” Below, I situate my findings on this topic with respect to relevant literature.

**Variables Inherent in the Natural Environment.** This study finds that a number of variables inherent in the natural environment inform the boundaries of the landscapes chosen by collaborators as their focal management area. These include landform, hydrogeography, ecosystem, and size, with ecosystem functioning as the driver. The literature supports the central role of the ecosystem in defining a landscape. Wiens and Milne (1989, p. 87) suggest that the boundaries of a landscape depend on the species and phenomena of interest, combined with the scientist’s specific research questions. Levin (1992, p. 1943) asserts that ecological phenomena can be studied at a variety of scales, that the choice of scale is critical because the scientist will observe different kinds of patterns depending on the scale of his or her inquiry. Further, he suggests that the patterns observed at different scales will have different causes and consequences. He urges us to examine the mechanisms that drive observed patterns and cautions us about a further complicating factor – that is, that those mechanisms may operate on a different scale than that of the observed patterns.

In linking a landscape to a particular ecosystem, collaborators seek to understand scale at which targeted ecological systems operate and to select landscape boundaries that encompass key parts of those systems. The comments of McKinney et al. (2010, p. 2) underscore the central role of scale in collaborative governance in the conservation arena; they say that there is “general agreement that the promise of large landscape conservation is its focus on land and water problems at an appropriate geographic scale, regardless of political and jurisdictional boundaries” (p. 2). In this context, participants’ understanding of the systems they are trying to change is essential to selecting appropriate boundaries of “the landscape” upon which they will focus their efforts. As noted by Levin (1992, p. 1943), choice of scale on which to focus is actually the “central problem of ecology” due to its profound impact on the patterns one will be able to see at his or her chosen scale, and the related fact that patterns observable at different scales are likely to have different drivers as well as consequences.

In the context of the CFLR Program, stakeholders generally share a priority focus on restoring forest health in order to reduce the likelihood of catastrophic wildfire. Thus, the central question in setting the boundaries of the landscape upon which they will focus their efforts is, “what is the scale of the ecological and human interactions that lead to forest fires?”

The analysis of Cash and Moser (2000) highlights the importance and the complexity of this question in writing about the challenges of integrating science and policy to effectively address environmental issues that play out at multiple scales. They suggest that answering this question for a particular environmental problem involves the following three challenges: (1) matching the scale of the management system to the scale of the biogeophysical basis of the problem; (2) matching the scale of the problem assessment and of the management response; and (3) adequately accounting for interactions where dynamics occurring at one scale affect those occurring at another scale (Cash & Moser, 2000, pp. 113, 118).

Cash and Moser recommend using an adaptive management approach to learn how to better integrate assessment and management at appropriate scales, “constructing long-term, iterative, experiment(s)...” in this area (Cash & Moser, 2000, pp. 109, 114-118). They also recommend using “boundary organizations” to successfully navigate these three scale-related challenges. Landscape-scale collaborative processes can be thought of as boundary organizations, in that they provide forums for effective communication across many dimensions (e.g., disciplines, social sectors, stakeholder groups, jurisdictions and levels of government, and different geographical areas within the landscape). The authors recommend leveraging the “scale-dependent comparative advantages” of various institutions, technical experts, and resources, that is, using each at the scale where it is most effective (Cash and Moser, 2000, pp. 109, 114-118). These insights and suggestions illustrate the bridge between ecosystem conditions and characteristics and human efforts to manage them—the latter of which I discuss in further detail below.

**Human Dynamics.** This study finds that, along with factors inherent to our natural environment, a number of “people factors” inform the boundaries of the landscapes on which we choose to collaborate when managing forest resources. These include longstanding cultural and spiritual ties to particular places in the area; community and economic uses of the land and its resources; current management goals; and political and jurisdictional boundaries. There is no “cookbook” for combining these “ingredients” to come up with the boundaries of the focal landscape; rather, collaborators talk through the various factors, seeking to make this decision in a holistic way.

The literature supports the idea that collaborators take into consideration multiple “people factors” in delineating a landscape for forest restoration, and that the resulting landscape boundaries often span multiple jurisdictions. McKinney et al. (2010, p. 2) observe that... “the promise of large landscape conservation is its focus on land and water problems at an appropriate geographic scale, regardless of political and jurisdictional boundaries.” Since the collaborative initiatives that were the subject of this study focus on restoration of forest ecosystems in part to reduce catastrophic forms of wildfire, collaborators give particular consideration to including portions of the wildland / urban interface within their chosen landscapes.

When delineating the landscapes on which they would collaborate, participants viewed existing social capital as an asset (e.g., existing relationships, existing agreement on the area needing restoration, and shared knowledge or understandings upon which collaborators would be able to draw). Wondolleck and Yaffee (2000, pp. 162-163) found that past relationships have served an enabling function for subsequent collaborative processes. In their study of the CFLRP Program and the JCLRP Program, Schultz et al. (2017, p. 1) found several things that reinforce the importance of this form of social capital in framing the focal landscape. They found that projects involving less contentious landscapes tended to be more successful (p. 1). Relatedly, they found that “(h)aving project goals that align with community, partner and agency goals created a unified vision and limited contention on the landscape” (p. 16). Finally,

they found that prior collaboration among participants was one of two success factors for these landscape-scale collaborative processes (pp. 3, 15).

Collaborators consider past, present, and desired future relationships between humans and nature in a particular area as they work to delineate the boundaries of their focal landscape. Cunningham (2010) speaks to temporal considerations in framing the “landscape” one will study, saying, “In trying to gain some understanding of how biological landscapes operate, you need to study interrelationships, and to do this you need to decide how to measure moving processes” (Cunningham, 2010, p. 49, paraphrasing conservation biologist Dick Richardson). He adds that “... change is always happening. Change is the most natural part of our landscape, and change is what we must embrace and learn to live with, for our ... landscape will be swept along in its continuing currents...” (p. 15). Thus, Cunningham is speaking not only of changes in ecosystems over time, but also how humans need to adapt to, or work with, those ever-changing ecosystems.

The literature supports consideration of cultural ties to the land in thinking about the boundaries of a management landscape. Ingram (2011, p. 1) observes that the effectiveness of collaborative natural resource management approaches depends in part on how they integrate varied “ways of knowing” among different communities of interest reinforces the importance of doing so. The USDA points out that the national forests of the U.S. contain numerous sites that are sacred to American Indians and Alaska Natives (AI/AN), and that AI/AN communities often require access to these sites to carry out particular ceremonies as part of their cultural responsibilities (2012, pp. 6-7). Basso (2000) explains that, for the Western Apache people in the Cibicue, Arizona area, landscapes embody cultural wisdom that is tied to events that happened in that place in the past and are thus integral to cultural identity. Cunningham asserts that, “The land has a memory,” which reflects the history of that landscape and “the life-forms that live on it, including ourselves and our experiences” (Cunningham, 2010, pp. 12, 299). Thus, the literature suggests that both social and ecological variables must be considered in defining the boundaries of a landscape.

Collaborators consider existing community and economic uses of the landscape in question, as well as their management goals, as they make choices about the portion of their region on which they will collaborate. The literature supports the idea that various human uses of the area’s natural resources are among those “people factors” that are considered. López-Hoffman, Varady, Flessa, and Balvanera (2010) point out that, when adjacent jurisdictions share ecosystems and species, they are also likely to share important ecosystem services. The Network for Landscape Conservation (2018, p. 1) identifies a number of such ecosystem services that we derive from our landscapes, including clean air and water, wildlife, food, fiber, jobs, recreation, public health, cultural heritage, community vitality, climate change mitigation, and protection from floods and fire, and a sense of identity.

### **Understanding Landscape-Scale Collaboration**

As we have seen above, there are five attributes that make collaborating on forest management at the landscape scale different from collaborating on smaller scales (e.g., the project level) or larger scales (e.g., nationally). These include: (1) the ability to work at a scale appropriate to the ecological systems that collaborators are trying to restore; (2) functioning as a “sweet spot” for achieving impact; (3) a high degree of scientific uncertainty; (4) the need for self-governance mechanisms; and (5) a counter-intuitive link between investing in relationships and maximizing efficient progress. Any single one of these attributes may not be unique to landscape-scale collaboration on forest resource management but taken together they comprise a unique and extremely promising phenomenon. The literature reinforces the importance of these qualities.

**Ability to Work at a Scale Appropriate to The Ecological Systems That Collaborators Seek to Restore.** Wondolleck and Yaffee (2000) find a trend in the literature arguing for a shift from fragmented land management to ecosystem-based resource management on broader scales in both the geographic and temporal sense that encompass both public and private lands (p. 14, 15). McKinney and Johnson (2009) assert that there is broad "... agreement that the promise of large landscape conservation is its focus on land and water problems at an appropriate geographic scale, regardless of political and jurisdictional boundaries" (p. 2). This point is also made by McKinney, Scarlett, and Kemmis (2010).

**"Sweet Spot" For Achieving Impact.** Numerous scholars make the point that collaborative approaches to natural resource management are effective ways to address challenges that involve many stakeholders and social sectors. For example, DuPraw, Brennan, and Placht (2013) define collaborative governance to refer to the routine use of collaboration by public sector decision-makers to determine how to resolve challenges, controversies, or outright conflicts over the best way to manage the public resources under their stewardship (p. 229). McKinney and Johnson (2009) see "regional collaboration" as an extremely promising way of filling the "governance gap" when a given policy or management problem does not fall entirely under the jurisdiction of any one entity (p. 2). Booher (2004, p. 32) suggests that collaborative governance can be thought of as a new, "more deliberative and democratic" approach to governance that occurs in a cross-jurisdictional governance "space," and offers a vehicle through which participants can deal with, among other things, policy interdependencies that prevent any one entity from being able to resolve an issue on its own and increasing cultural diversity. The Network for Landscape Conservation (2018) asserts that "the landscape" is becoming the "operative unit for conservation" (p. 2), and that landscape-scale conservation "brings people together across geographies, jurisdictions, sectors, and cultures to re-weave fragmented landscapes and safeguard the ecological, cultural, and economic benefits they provide" (p. 6).

**High Degree of Scientific Uncertainty.** Booher (2004) notes that collaborative governance is an effective approach to dealing with increasing complexity and uncertainty in the governance arena (p. 32). Scholz and Stiftel (2005) discuss collaborative governance as an effective vehicle for adaptive management in the pursuit of the sustainability of both natural and human systems (p. vii); in fact, they coin a new synonym for collaborative governance: "adaptive governance." Wondolleck and Yaffee discuss the importance of adaptive management in natural resource management, citing early thought leadership on this topic by Holling and Lee (Holling, 1978; Lee, 1993, as cited in Wondolleck & Yaffee, 2000, pp. 15-16); in this context, the authors quote Lee as suggesting that adaptive management can serve as our compass and "conflict bounded by negotiation can provide a 'gyroscope' that can keep us balanced as we move in the appropriate direction" (Lee, 1993, as cited in Wondolleck & Yaffee, 2000, p. 16). Wondolleck and Yaffee also underscore the point that natural resource management requires context-specific knowledge (p. 15, citing Kohm & Franklin, 1997).

**Need for Self-governance Mechanisms.** Wondolleck and Yaffee (2000, pp. 147-150) discuss the trend in natural resource management toward decentralized decision-making and its value in cultivating shared ownership of the challenge, the process for addressing that challenge, and the outcome of that process. Together, these result in greater commitment to the problem-solving enterprise. The authors describe several examples of collaborative natural resource management processes where stakeholders took proactive steps to establish self-governance mechanisms (pp. 180-181); in the words of one such stakeholder (Bill Potter,

Blackfoot Challenge , as cited in Wondolleck and Yaffee, 2000, p. 181): “We realize that if you do not make the rules, someone is going to make them for you. It is a lot easier to follow your own rules.”

**Need to Invest in Relationships to Maximize Progress.** In an inquiry into why cooperation is part of the human evolutionary story, Nowak (2012) highlights indirect reciprocity as the most common driver for mutual aid. In this form of cooperation, people help each other based on their respective reputations. This reinforces the importance of would-be collaborators getting to know each other early on and building trust. Wondolleck and Yaffee (2000, p. 163) note that many collaborative processes start from conditions of strong distrust, and that success requires intentional steps to remedy that. Booher (2004) explicitly suggests that collaborative governance is an effective vehicle to meet the need for expanded trust-building in the public sector (pp. 32-33). Kemmis (1990, p. 118) suggests that, “... the actual practice of finding solutions that people can live with usually reaches beyond compromise to something more like neighbourliness... (which) is inconceivable without the building of trust, of some sense of justice, of reliability, of honesty.” (Schultz et al., 2017, pp. 3, 15) found that transparent communication among participants was one of two success factors in their study of the CFLRP Program and the USDA’s Joint Chiefs’ Landscape Restoration Partnership.

The work of the scholars discussed above serves to support the findings of this study with respect to the unique characteristics of landscape-scale collaboration and how such “landscapes” are defined. This study, in turn, is complementary to – and perhaps elaborates upon -- the scholarship of Emerson and Nabatchi (2015). These co-authors have proposed an integrative framework to give coherence to collaborative governance research, practice, and evaluation. They invite fellow scholars to test and enhance it. The study underlying this article should ultimately add richness to one particular aspect of this framework within the group of collaborative dynamics that Emerson and Nabatchi suggest can initiate collaborative action – that is, stakeholders’ capacity to pursue joint action if they choose to do so. The present article lays the foundation for enumerating those capacities and strategies for developing them in one specific context – landscape-scale collaborative forest resource management – by defining that phenomenon.

### **Limitations of the Study and Generalizability of Results**

This study is based on thirteen interviews and nine focus groups. These collectively involved the participation of 38 people, based all over the US. They produced 22 transcripts (over 1,000 pages) for analysis. This is a very robust data set for a grounded theory study focused on the production of substantive theory. At the same time, this methodology is considered applicable only in the context studied.

Consequently, it is reasonable to assume that the results can be generalized to apply to the CFLR Program as a whole. Beyond the CFLR Program, one can conceptualize concentric rings emanating out to encompass other arenas that share some attributes with the CFLR Program; perhaps the next ring out could be thought of as landscape-scale collaborative forest restoration programs sponsored by different agencies. Beyond that might be landscape-scale collaborative programs that focus on managing natural resources other than forests, and then collaborative forest restoration programs that take place on smaller or larger scales. The further out one goes in this set of rings, the less applicable will be the findings from this study. The findings from this study reliably apply only to the CFLR Program.

## Areas for Future Research

While fire is a productive element of many natural forest ecosystems (e.g., stimulating the release of certain seeds, clearing space for sun-loving plants to grow), the catastrophic scale of many of today's forest fires is not natural. Rather, it reflects society's historic preference for suppressing all forest fires. This leads to more dense forests and thick undergrowth; when a cigarette is dropped in that type of forest, the resulting fire burns far more acres and burns far hotter than it would have under natural conditions. The associated risk to human life and property in communities adjacent to national forests, as well as the risks to firefighters, has become unacceptable.

Thus, understanding what it takes to collaborate effectively at the landscape scale to reduce the risk of catastrophic wildfire and how to develop those collaborative capacities is essential to the USDA/FS and its stakeholders. Collaborating at the landscape scale provides a unique and powerful opportunity to harness stakeholder interests and resources for maximum traction in restoring forest ecosystems and reducing wildfire risk. It is a scale at which conflict – whether latent or full-blown – can be addressed in meaningful and constructive ways. Study participants reported that at its best, landscape-scale collaboration affords opportunities for ecological, social, personal, and spiritual healing.

O'Laughlin (as cited in Schultz, Jedd, & Beam, 2012) makes the point that, "(t)here is the potential for the CLR, if implemented well, to break through the persistent gridlock in US forest management and pave the way for more efficient and effective forest management." The Chief of the USDA/FS, the Western Governors' Association, and many others have reinforced the value of the CFLR Program (Schultz, Jedd, & Beam, 2012). The remarkable results achieved through the CFLR Program reflect participants' dedication to the forests that are special to them, the simple logic of working at the scale on which the ecosystem that collaborators are trying to restore actually functions, and the growing awareness of how much more can be achieved when we work together. The CFLR Program's 2015 5-Year Report reflects that, "During the past 5 years, we learned that bringing diverse community perspectives together through collaborative processes helps build resiliency to unexpected events, identify creative solutions, and create the social agreements that ensure long-term sustainability and support for project goals" (USDA, 2015, p. 14).

Despite many collaborative successes as reflected in the CFLR Program, there remains much untapped potential in the use of collaboration as an effective way to carry out the USDA/FS' multiple use mandate, minimize unnecessary conflict, channel residual conflict toward positive outcomes, and reduce risks of destructive forms of wildfire. It is the author's hope that this article, elucidating the phenomenon of landscape-scale collaboration on forest resource management, contributes to our ability to use this approach to maximum benefit. Related research topics of pressing concern include: (a) the implications of these unique characteristics for the specific capacities needed to collaborate at this scale; and (b) strategies for developing those capacities. I investigated these topics as part of this same study and anticipate publishing on these topics in the near future. In addition, replicating this study in similar arenas -- sponsored by different agencies or focusing on resources other than forests -- would be valuable in testing how broadly the findings apply and developing formal, cross-cutting theory to guide the development of capacities needed to collaborate on the landscape scale.

## Management Recommendations

The primary management recommendation emerging from this stage of the study is that collaborative forest restoration programs should explicitly embrace and affirm the importance



of contextual factors in setting the boundaries of landscapes proposed for inclusion in the program. Program literature should provide a discussion and examples of the range of considerations that others have used in framing their focal boundaries to support program applicants in thinking through this complex issue. Additional management recommendations will be forthcoming in subsequent articles on: (a) the specific capacities needed to collaborate at the landscape scale; and (b) strategies for developing those capacities.

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