

AN ABSTRACT OF THE THESIS OF

Andrew D. Spaeth for the degree of Master of Public Policy presented on June 6, 2014.

Title: Resilience in Collaborative Forest Landscape Restoration: The Lakeview Stewardship Group's Response to the Barry Point Fire.

Abstract approved:

Edward P. Weber

Congress created the Collaborative Forest Landscape Restoration Program (CFLRP) in 2009 with the passage of the Forest Landscape Restoration Act (Omnibus Public Lands Management Act of 2009 Title IV). The purpose of the CFLRP legislation is to implement forest restoration work on national forest lands through a competitive grant program. This study examines how the Lakeview Stewardship Group, a CFLRP selected project, responded to a large exogenous shock, the Barry Point Fire. The Barry Point Fire started on the Fremont-Winema National Forest on August 5, 2012, and burned more than 92,000 acres of forestland. The fire impacted more than 50 local private landowners, who lost timber and grazing resources including livestock, hundreds of miles of fencing, and active timber sales. On public forest land, more than four years of "shovel ready" ecological restoration projects burned in the fire, forcing the Lakeview Stewardship Group to reexamine management strategies and adapt to the changed conditions on the ground. Results from sixteen semi-structured qualitative interviews suggest that this collaborative group of land managers was successful at developing consensus around the Barry Point Salvage Project, assuaging litigious environmental groups, and maintaining clear communication and a strong focus on ecological restoration planning and implementation following Barry Point. The group's demonstrated resilience in the face of this large exogenous shock stems from the strong relationships and trust among stakeholder involved in the collaborative process, the partnership with the U.S. Forest Service, experience with previous wildfires, and the group's commitment to an active adaptive management approach.

©Copyright by Andrew D. Spaeth
June 6, 2014
All Rights Reserved

Resilience in Collaborative Forest Landscape Restoration: The Lakeview Stewardship
Group's Response to the Barry Point Fire

by
Andrew D. Spaeth

A THESIS

submitted to

Oregon State University

in partial fulfillment of
the requirements for the
degree of

Master of Public Policy

Presented June 6, 2014
Commencement June 14, 2014

Master of Public Policy thesis of Andrew D. Spaeth presented on June 6, 2014.

APPROVED:

Edward P. Weber, representing Political Science

Denise Lach, representing Sociology

Bruce Weber, representing Applied Economics

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.



Andrew D. Spaeth, Author

ACKNOWLEDGEMENTS

This essay could not have been completed without the assistance of a great number of people. The members of the Lakeview Stewardship Group and the community of Lakeview have been welcoming and generous. I am also indebted to Ed Weber, Brent Steel, Denise Lach, Sally Duncan, and Bruce Weber for their scholarly insights and thoughtful feedback throughout the development of this project and the writing of this essay. Support from the Oregon State University School of Public Policy and Rural Studies Program made this research effort possible. Partial funding for this research was provided by a grant from the National Institute of Food and Agriculture (NIFA), Higher Education Challenge (HEC) Grants Program (“Climate Change Adaptation, Sustainable Energy Development and Comparative Agricultural and Rural Policy,” 2013-2016). The loving support from my family and friends has helped provide necessary breaks throughout graduate school. Although I have benefited greatly from the sources of help listed above and numerous others, the views expressed in this essay, as well as any faults, are the sole responsibility of the author.

TABLE OF CONTENTS

	<u>Page</u>
1 Introduction	1
1.1 Examining the Resilience of Social-Ecological Systems	3
2 Methodological Approach	3
3 Literature Review.....	6
3.1 Social-Ecological Systems.....	6
3.2 Collaborative Governance Theory.....	9
3.3 Collaboration in Social-Ecological Systems.....	13
4 Policy Context: U.S. Federal Forest Policy	19
4.1 Fire Suppression.....	19
4.2 Collaboration and Ecological Restoration	22
5 Case Study: The Lakeview Stewardship Group	26
5.1 The Community of Lakeview	26
5.2 The Lakeview Stewardship Group.....	29
5.3 A Large Exogenous Shock: The Case of the Barry Point Fire	32
5.4 The Lakeview Stewardship Group’s Response to Barry Point.....	35
5.5 Sources of Resilience	39
5.6 Key Challenges and Future Direction	46
6 Conclusion	51

TABLE OF CONTENTS (Continued)

	<u>Page</u>
7 Reference	53
8 Appendix	61

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Public and Private Forestland Burned in Wildfires (1985-2012).....	20
2. Federal Spending on Fire Suppression (1985-2012).....	21

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Interviews by Organizational Type.....	5
2. Barry Point Fire Timeline.....	33
3. Timeline of Key Events	61
4. Members of the Lakeview Stewardship Group.....	62

1. INTRODUCTION

“The present is the only actionable moment, but it is not a moment alone. The...fire came into being because of previous conditions that prepared the forest to burn. The fire left its mark – on people, a place, the land – some more lasting than others. It’s difficult to pinpoint when it ended or when it began. Even before the lightning strikes, the seeds of fire existed in the dry tree branches and roots. I could say there was fire, then there wasn’t fire anymore, but the Buddha’s words feel most true: All is aflame.”

-Colleen Moton Busch, Fire Monks (2011, p.244)

The community of Lakeview, Oregon, known as the “Tallest Town” in the state at nearly 4800 feet above sea level and is found in a high desert ecosystem of Oregon’s Outback. The identity of the community and the loggers and ranchers there is strongly tied to the abundant natural resources and wide open spaces that dominate south-central Oregon.

On October 10, 1950 the Chief of the Forest Service created the Lakeview Federal Stewardship Unit. A 500,000-acre block of land composed of ponderosa pine and mixed conifer forest with lodgepole, white fir, sugar pine, and incense-cedar. Logging and grazing dominated the landscape and brought economic development to the community. In 1968, timber harvest on the unit exceeded 400 million board feet a year, and in 1990, Lakeview supported three sawmills and nearby Paisley supported a mill. The downturn in the logging industry in the 1990’s, largely driven by lawsuits to protect the Northern Spotted Owl, led to three of the four mills to close in Lake County between 1990 and 1996. The mill closures sparked a federal review of the designation of the Lakeview Stewardship Unit, and led to socio-economic decline in Lakeview due to the reliance on direct and indirect employment associated with the timber industry.

Local community leaders, interested in finding a compromise with litigious environmental groups, and desperate to bring some economic stimulus back to the community, suggested the idea of Forest Stewardship Council (FSC) certification on the Stewardship Unit in order to ensure a reliable and sustainable harvest of forest products to support the remaining mill. To that end, the community, in partnership with community development interests, invited a panel of scientists including the likes of Jerry Franklin and Jack Ward Thomas, as well as environmental groups, and interested citizens to attend a two-day meeting to explore certification of the Stewardship Unit. In total, more than 90 people turned out. Environmental representatives came prepared to oppose FSC certification, arguing that it only legitimized harvest. The group quickly realized that certification was too contentious. To date, agreement around certification has never been reached, however the group purposefully chose to shift the conversation towards their shared values for the landscape and the community. The group talked more about what they had in common than what they didn’t, and put the contentious issue of certification aside. At the end of that two-day meeting, a dedicated group of land managers including representatives from industry, the Forest Service, the community, and environmental groups emerged, coming together to form the Lakeview Stewardship Group.

The group moved from a highly contentious, adversarial setting to one based on consensus by being honest with each other about their values for the forest and community. This helped to establish a shared vision, to enhance the socio-economic and ecological health of the community and Stewardship Unit respectively. Meanwhile, the lack of logging activity on the Stewardship Unit over the three decades beginning in the 1990's, combined with federal land management strategies focused on fire suppression, set the stage for high, and growing, fuel loads, necessarily increasing the potential for catastrophic wildfire. And in fact, during the first week of August of 2012, lightning ignited the Barry Point Fire, which eventually burned 92,940 acres of public and private forestland on and around the Stewardship Unit. The fire severity was high on over 40% of the fire perimeter, killing more than 75% of the living vegetation. The Collins Pine Company, the only remaining industry in Lakeview, and owner of the Fremont Sawmill, lost high-value standing timber on 25% of their land holdings in a ten-day period of the fire. And, the Lakeview Stewardship Group lost more than four years worth of consensus-based restoration treatment project acres in the fire. Members of the collaborative described the Barry Point Fire as a tremendous loss, inciting anger and uncertainty, and forcing the group to reevaluate the work they had done, and question what was truly attainable in the future.

Yet despite all the anger, uncertainty, and reevaluation of their cooperative work, in the end the Stewardship Group overcame the external disruption caused by the Barry Point Fire and emerged unified and committed to the collaborative process. The capacity of the group to respond to the fire is a product of their more than 16 years of working together, a recognized interdependency with the Forest Service and Collins Companies, previous experiences with large wildfires, and an adaptive management strategy rooted in a scientifically based, collaborative decision making process.

The research question pursued in this study, how the Lakeview Stewardship Group responded to a large natural disaster, the Barry Point Fire, works to contribute to the burgeoning body of literature on resilience in social-ecological systems drawing from our understanding of collaborative governance, adaptive management, and social capital. The larger question here is how do communities, comprised of groups of people, respond to natural disasters and their aftermath. More specifically, in this case, the study examines how a specific group of land managers responded to the aftermath of a large wildfire that brought with it tremendous challenges as well as unique opportunities to further restore socio-economic and ecological well-being.

The next section is a brief introduction to coupled human-natural systems, often referred to as social-ecological systems, and the study of resilience in that context. Next, the methodological approach taken in this study is described, and followed by a review of the relevant literature. Results are drawn from the semi-structured qualitative interviews with key members of the Lakeview Stewardship Group. Interviews shed light on the ability of collaborative land managers to respond to the Barry Point Fire, and data from the interviews show that the collaborative group was

successful at developing land management strategies that allowed them to continue to move forward to achieve land management and community development goals.

1.1 Examining the Resilience of Social-Ecological Systems

Coupled social-ecological systems are defined as “nested, multilevel systems that provide essential services to society such as supply of food, fiber, energy, and drinking water” (Binder et al. 2013). The link between human and natural, or social-ecological systems, transcends political boundaries, traditional governance arrangements, and prescriptive hierarchical management strategies. In many places around the globe, societal actions are reducing the capacity of Earth’s systems to change and adapt in the face of disturbance. Resilience is the capacity of systems to absorb disturbance while maintaining structural and functional¹ complexity (Wilson et al. 2013, Goldstein 2012, Bullock et al. 2012).

Of specific importance to this research is the concept of resilience as applied to social-ecological systems. This is because, as described above, the healthy, long-term structural and functional capacity of a social-ecological system is reliant on the resilience of such a system. Therefore, examining questions of resilience requires an understanding of both ecological interactions as well as the social systems’ capacity to respond to and shape ecosystem change (Folke 2006, Hahn et al. 2006). The body of research on this topic generally seeks to discover how to develop and sustain coupled human-natural systems that are responsive to disturbance and uncertainty (Hahn et al. 2006). For example, studies seek to contribute to societies broader understanding of how communities respond to natural disasters, and how society will prepare for unpredictable shifts in ecological systems, such as those predicted under various climate change regimes. Bodin and Prell (2011) articulate the assumptions that are inherent in this type of social relational approach. In short, social, cultural, political, and economic factors are interrelated, and social structures are formed from the interactions between these factors.

2. METHODOLOGICAL APPROACH

Researchers have approached resilience from both a quantitative and qualitative perspective. The quantification of resilience is most developed in studies by Cutter et al. (2010) and Nelson (2009a), and in the more descriptive, qualitative based literature by Folke (2006), Bodin et al. (2006), and Walker et al. (2006b). The quantitative approach to measuring social-ecological resilience is widely criticized as suffering from 1) arbitrary model specification and variable selection, which results in non-generalizeable and non-verifiable results; and 2) data limitations and the liberal use of proxies that attempt to measure the dimensions and interactions between factors that occur at multiple scales (Lee 2014, Reams and Lam 2013, Smit and Wandel 2006).

¹ Function is defined as the “emergent outcomes (goods, services, and options) from the processes of the [Social-Ecological System],” and structure is the pattern of relationships between the different components of the system (Wilson et al. 2013).

Smit and Wandel (2006) argue that resilience is an inherently complex concept, and community specific factors such as the divergent social, economic, and ecological conditions play a critical role in the outcomes following a given disturbance. Therefore, many of the coupled social-ecological systems effects related to resilience are more easily described² than quantified (Reams and Lam 2013, Folke 2006). Qualitative research focused on resilience in social-ecological systems has focused on three critical components: 1) ecosystem health and human influence on ecological systems, 2) the ecological and social capacity to respond to disturbance based on adaptive management strategies, and 3) sources of social resilience including social capital and social networks.

2.1.1 The Lakeview Stewardship Group as a Case Study

In the case of the Lakeview Stewardship Group's response to the Barry Point Fire, this study examines how the collaborative group of land managers responded to the aftermath of the fire in a single, qualitative case study³. Yin (2014) defines a case study⁴ as "an empirical inquiry that investigates a contemporary phenomenon (the "case") in depth and within its real-world context" (p.16). And, exploratory case studies attempt to shed light on a situation that has no clear, single set of outcomes (Yin 2014). In this case, the collaborative group's response to the fire includes multiple outcomes, that prior to this study were not clearly identified, and which occurred in a setting that is dictated by social, economic, and ecological factors.

In case study research, multiple sources of data are used in a triangulating fashion to converge on the topic of interest (Yin 2014). In this case, the research design relies on an archival document analysis of published and unpublished documentation from a range of primary and secondary sources that is supplemented by qualitative interviews with key informants. It is important to note that the unit of analysis in this study is the Lakeview Stewardship Group, which includes individual members who were interviewed and data aggregated in order to analyze the group's response in totality.

2.1.2 Archival Document Analysis

Documentation is a stable, unobtrusive source of information that contains specific information about the topic of interest across a relatively broad time period, covering events prior to, during, and after the event (Yin 2014). Relevant documents used in the analysis include: the Collaborative Forest Landscape Restoration Program (CFLRP) proposals and annual reports, organizational websites and management

² Qualitative studies are of particular interest in cases where there is a need to develop detailed descriptions and to learn about a topic that the researcher is not able to see in person, integrate multiple perspectives, and describe how events occurred (Weiss 1995).

³ There are important limitations of this study. A single case is not often widely generalizable to other contexts or situations.

⁴ Case study research is the preferred method when the questions of interest is a "how" or "why" question, where the researcher has no control over behavioral events, and when the study is of a contemporary, as opposed to a purely historical, issue (Yin 2014).

strategy documentation, collaborative meeting minutes and project proposals, Environmental Analyses, and restoration planning documents. All documents were reviewed and information relevant to the Lakeview Stewardship Group’s response to the Barry Point Fire included in the analysis in this report.

2.1.3 Qualitative Interviews

Semi-structured qualitative interviews were used to gather information from individual members of the Lakeview Stewardship Group who have been directly involved in collaborative land management efforts. The purpose of the interviews was to help direct the study towards the most pertinent and relevant details, and to capture an observer’s perspective on the group’s response to the Barry Point Fire. In total, sixteen interviews were conducted with key informants⁵ between February 19 and March 26, 2014⁶. The interviews worked to understand individual’s history in the collaborative, decision-making processes, the impact of the Barry Point Fire on the community and the collaborative group, the challenges associated with the fire event, and the collaborative group’s response to the fire. The table below illustrates the number of interviews from each of the types of organizations represented in the Lakeview Stewardship Group.

Table 1: Interviews by Organizational Type

Organization Type	Interviews
Government	6
Environmental	4
Other NGO	2
Industry	2
Concerned Citizen	2
<i>Total Interviews</i>	16

Following from Weiss (1995), the “panel” of key interviewees was assembled to include respondents who 1) experienced the event of interest (i.e. Barry Point Fire), 2) are different people who hold different jobs at different levels and represent different individual groups, 3) are linked both by their collective experiences and collective action mandate, and 4) affect and are affected by the social institution of interest (i.e. Lakeview Stewardship Group). The sample of interviewees was drawn from a publicly available list of formal members of the collaborative group⁷. Collectively, the interviewees included environmental interests, industry representatives, federal land management agency staff, local community groups and non-profit organizations, and concerned citizens. Again, See Table 1 for how this study’s interviewees were distributed across the main organizational interests within the collaborative group.

⁵ A key informant is defined as one who works within or on the periphery of the institution, in this case, the Lakeview Stewardship Group, and who was involved the group’s response to the Barry Point Fire through their involvement in collaborative meetings, discussions, or agency decision-making processes.

⁶ Approximately one half of the membership of the Lakeview Stewardship Group were interviewed as part of this study and saturation of the data was achieved after the twelfth interview.

⁷ See the appendix for a list of members of the Lakeview Stewardship Group that was produced in 2011 as part of the group’s Collaborative Forest Landscape Restoration Program proposal.

3. LITERATURE REVIEW

The focus of this literature review is on social-ecological resilience. This necessarily includes an introduction to exogenous shocks and ecological resilience, where the resilience concept first emerged in scholarship. The section then applies the resilience concept to social-ecological systems and the adaptive cycle. Collaborative Governance Theory is introduced to describe a framework within which land management decisions in social-ecological systems occur. The literature review then ties together the collaborative approach with the social capital and adaptive management literature, positioning the Lakeview Stewardship Group within the larger Grass-roots Ecosystem Management (GREM) movement.

3.1 Social-Ecological Systems

Social and ecological systems today are inextricably linked – at local, regional and global scales – as humans’ impact on earth continues to grow (Bodin and Prell 2011). Human systems rely on natural systems for basic resources and thus provide the sideboards or limitations on human growth and consumption. Research is needed to better understand the dynamic relationship between human and natural systems, in large part, because human actions and poor management activities are degrading the capacity of natural systems to adapt to changing climactic conditions and support a growing human population (Folke et al. 2004). In other words, human institutions and the ways that society chooses to conduct business and organize activities affect the conditions of ecological systems, which have implications on the carrying capacity of the planet, not only for human populations, but all biotic life (Dietz et al 2003). Ecosystems can be managed in such a way that fosters resilience to climate change and disturbances such as floods and wildfire, which is an increasingly important concept in preparing for an uncertain future (Walker et al. 2006b).

3.1.1 Exogenous Shocks

An exogenous shock is an unpredictable event, such as a wildfire, flood, or hurricane that impacts the capacity of a social-ecological system. In response to a disturbance, a population commences a set of biophysical and sociological changes that allow it to survive or cause it to perish, and the effects of a shock can be both positive and negative (Walker et al. 2006b). For example, in ecological systems disturbances can play an important role in resetting the ecological clock, often returning the system to some previous stage of successional development and providing space for certain species to thrive at the expense of species who previously flourished (Holling 1973). In cases where systems display a negative response to a shock, populations will decline, ecological or socio-economic function will degrade, and ultimately the capacity of the system to provide habitat or goods and services will reduce the carrying capacity and quality of the system. Negative examples are often referred to as exogenous shocks that destabilize existing systems and result in altered ecosystem structure and function (Zellner et al. 2012, Jannsen et al. 2006). This can occur in a single intense event, through a slow decline, or some combination of the two (Briske et al. 2008).

3.1.2 Adaptive Cycle

The adaptive cycle describes how social-ecological systems reorganize following an exogenous shock, accounting for abrupt and linear changes that occur following a disturbance (Walker et al. 2006b). These changes and the relationship between the phases are often discussed in terms of the ‘fore’ loop and the ‘back’ loop (Walker and Salt 2006). The fore loop consists of rapid growth and conservation, where life is “predictable” and resources are allocated in a relatively efficient manner. The back loop consists of release and reorganization following an exogenous shock. Rapid growth is where the system is at a maximum rate of growth given available resources, and where species or actors take advantage of every possible ecological or social niche. The conservation phase is characterized by incremental transition towards specialists, who now have a competitive advantage over opportunistic species, who thrived in the previous phase. In this phase, the system becomes increasingly stable, but across a smaller range of conditions, and “[c]onnections between actors increase” (Walker and Salt 2006, p.76). The release phase occurs immediately following a disturbance that exceeds a threshold, and in general, the longer the conservation phases persists, the smaller the shock necessary to begin the release phase. The release of resources, such as human and natural capital, will then be reorganized and return to a previous phase in the cycle⁸ (Walker and Salt 2006).

3.1.3 Ecological Resilience

Traditional ecological thought viewed ecosystems in terms of a single equilibrium, climax community. Resilience is a concept born out of ecology that challenged that traditional view by advocating for a range of variability within ecosystems (Folke 2006). Ecological resilience is defined as the ability of a system to absorb change and disturbance while maintaining integral functional characteristics and structural traits (Briske et al. 2008, Holling 1973). The function and structure of an ecosystem defines the “state” of the system and is indicative of its ability to cope with different types of disturbances (Briske et al. 2008, Adger 2006). Understanding the coping range of a given system or community and then recognizing how management strategies⁹ might enhance that coping range are critical in building social-ecological resilience (Yohe and Tol 2002).

3.1.4 Resilience in Social-Ecological Systems

Fostering adaptation to future, often-unpredictable change requires the capacity to respond within the social domain and “shape ecosystem dynamics” in an informed way (Walker et al. 2006b, Folke 2006, p.262). Adaptation from an ecological

⁸ The majority of the time a system is in the fore (e.g. growth and conservation) loop, (as opposed to release and reorganization) so policy makers and society have developed and adopted public policy that perpetuates those undisturbed, desirable states. In reality, an equally important public policy would focus on the back loop (e.g. release and reorganization) and work to ensure that the reorganization phase, when it does occur, is not susceptible to destructive forces that may irreversibly change the trajectory of the system (Walker and Salt 2006).

⁹ Land managers are often particularly interested in thresholds, which are the conditions required to move the system into an alternative state, thus changing ecosystem structure and function (Briske et al. 2008, Walker et al. 2006b, Yohe and Tol 2002).

perspective is about how species respond to changes in the environment and persist, in other words, continue to survive and reproduce. In the social sciences, adaptation is about how cultures, communities, and individuals adjust to their social, environmental, and economic context, to not only survive and reproduce, but also to actively work to build less vulnerable institutions (Smit and Wandel 2006).

A summary definition of social-ecological resilience includes four critical components: 1) the ability to absorb disturbance without crossing a threshold to a new “state” (Reams and Lam 2013, Bojórquez-Tapia and Eakin 2012, Bullock et al. 2012, Briske et al. 2008, Carlsson and Sandstrom 2008, Adger 2006, Walker et al. 2006b, Walker and Salt 2006, Folke 2006, Hahn et al. 2006, Gunderson 1999). 2) A self-organizing system that demonstrates efficacy in the reorganization phase following an exogenous shock (Reams and Lam 2013, Bojórquez-Tapia and Eakin 2012, Bullock et al. 2012, Goldstein 2011, Goldstein and Butler 2012, Adger 2006, Folke 2006, Walker et al. 2006b). 3) The capacity of the system to integrate transformative learning and adaptation (Reams and Lam 2013, Bullock et al. 2012, Goldstein and Butler 2012, Goldstein 2011, Carlsson and Sandstrom 2008, Adger 2006, Hahn et al. 2006). 4) The capacity of the system to retain structural integrity and functional diversity in response to an exogenous shock (Goldstein and Butler 2012, Carlsson and Sandstrom 2008, Folke 2006, Janssen et al. 2006, Walker and Salt 2006, Walker et al. 2006b, Gunderson 1999).

Systems inherently maintain some resilience to change over time and space (Holling 1973), which influences societies ability to govern resource use (Ostrom 1990). “[O]ne should expect that resource systems that can be rapidly destroyed...are far more difficult to govern by appropriators, or anyone else, than are [resources] that are somewhat more resilient following damage” (Ostrom 1990, p.208). This is due, in part, to the fact that in cases where there are fast rates of change, institutions often fail to adapt (Dietz et al 2003). Gunderson (1999) points out that “[w]hen shifts occur between alternative states or conditions, they are usually signaled as a resource crisis.... If these shifts in stability domains are viewed as a crisis, then understanding how and why people choose to react is key to managing for resilience” (p. 4). Zellner et al. (2012) describes two cases, water pollution and homelessness, in which an understanding and communication of the vulnerability of the system, inspired collective active and fostered trust among a diverse group of people to develop novel approaches to the problems at hand.

A social-ecological systems response to a given shock depends on the intensity and severity of the disturbance, connections across different (social, political, economic, ecological) scales, and the state that the system was in prior to the disturbance (Walker and Salt 2006, Walker et al. 2006b). In a resilient social-ecological system, a disturbance or shock provides the opportunity to implement new innovations and developments, whereas in a vulnerable system, it is expected that a disturbance or shock will degrade socio-economic and ecological conditions (Folke 2006, Hahn et al. 2006). Resilience can also have positive or negative connotations (Walker et al. 2006b). For example, resilient systems can get caught in undesirable regimes that

persist in lieu of large, catastrophic disturbances (Walker et al. 2006b). Zellner et al. (2012) depicts this negative connotation as persistence of a non-adaptable system, which can perpetuate inequalities, divisiveness, and buttress transitions to more healthy and robust systems (Bullock et al. 2012). Alternative institutional arrangements, such as collaborative governance, are one approach to improving social-ecological system performance in cases where rigid, non-adaptable regimes previously endured (Goldstein and Butler 2012).

3.2 Collaborative Governance Theory

Collaboration has been used as an effective strategy to manage contentious local resource disputes around the globe, and the increasing level of participation among a diverse set of organizations and individuals is unprecedented (Ansell and Gash 2008, Weber 2000). Collaborative governance, also referred to as collaborative learning, participatory management, interactive policy making, and collaborative management among others, is defined as a governance framework that involves the participation of multiple stakeholders, often including both state and non-state actors, in a formal, consensus-oriented decision making process that works to effectively manage public programs and natural resources (Ansell and Gash 2008, Weber 2003, Daniels and Walker 2001).

The collaborative process relies on independent, interdependent stakeholders who may have divergent opinions, preferences, and values, but who come together to resolve disputes, generate agreements, learn from one another, and foster on-the-ground solutions to natural resource challenges (Goldstein and Butler 2012, Weber 2003, Daniels and Walker 2001, Ostrom 1990). Participants engage because it allows them to coalesce around a common problem, determine a best route of action rooted in common interests, reach goals more quickly, and build credibility with their partners (Daniels and Walker 2001). One of the key benefits of collaboration is that it brings together otherwise disparate stakeholders to make collective decisions, which is of particular importance in cases that transcend man-made boundaries, regulations, and agency jurisdiction (Ansell and Gash 2008, Weber 2003, Daniels and Walker 2001). Collaborative arrangements often form around environmental issues, but also work to maintain or enhance the socio-economic status of local communities (Weber 2003).

3.2.1 Collaboration and Social Movements

Collective action facilitated through a collaborative approach may be likely to emerge in social and political spheres where social movements are active (Ansell 2003, p.124). Grass-roots, collaborative approaches to land management were born out of the contemporary environmental movement, which brought with it a history of top-down and command and control approaches to environmental challenges (Ansell and Gash 2008, Scholz and Wang 2006, Weber 2000). In the American West, traditional, top-down land management approaches have led to catastrophic wildfire, pest infestation, and a history of adversarial approaches that contributed to the domination of gridlock and litigation (Weber 2000).

The most recent major environmental movement in the United States called the Grass-Roots Ecosystem Management, or GREM¹⁰, is a burgeoning movement, particularly strong in the American West, where decentralized, collaborative governance arrangements are taking a holistic, tripartite approach to achieving the social, economic, and ecological goals of communities (Weber 2000). GREM inspires and engages local people to find solutions to local problems, fosters a holistic strategy to environmental issues, sees cutting-edge science and technology as critical, produces tangible results, and enhances the problem solving and adaptive management capacity of the local community. In the arena of natural resource issues, GREM has resulted in high-level ideas about forest restoration being operationalized by local stakeholders, who have a deep sense of place and a desire to find solutions to the dynamic challenges they face (Weber 2003). In these cases, and articulated in seminal work by Ansell and Gash (2008), the ability of collaborative groups in achieving tripartite –ecological, economic, and social- outcomes is influenced by the starting conditions, leadership, and institutional design of the decision-making process.

3.2.2 Starting Conditions

Starting conditions include the history of conflict or cooperation, incentives for participation, and power and resource imbalances (Ansell and Gash 2008), and similarities of interest and assets of participants (Ostrom 1990). Starting conditions are critical because the “conditions present at the outset of collaboration can either facilitate or discourage cooperation among stakeholders and between agencies and stakeholders” (Ansell and Gash 2008, p.550). If there is a history of antagonism or conflict among participants, collaborative governance is at risk of not succeeding because of the lack social capital, and thus trust, within the system (Weber 2013, Ansell and Gash 2008).

Ansell and Gash (2008) recommend that in cases of with a prehistory of conflict that stakeholders agree to set aside time to build trust, and if the group is not dedicated to building trust, then they should not undertake a collaborative strategy. Building trust starts with an inclusive process that works to ensure that there is a broad range of participants, transparency and open-access, and accountability (Weber 2003). Further, starting with the most difficult challenges is often not an effective strategy, beginning with the low hanging fruit or easy wins allows the diverse group of participants to build trust before having to make big decisions (Newman and Dale 2005).

Mini victories or “small wins” are important in building momentum and, over time, lead to successful collaboration in the long run (Weber 2013, Ansell and Gash 2008). The successful completion of collaborative endeavors, regardless of the size of the

¹⁰ Description of the GREM cases outlined in Weber (2003) include: 1) coalitions of otherwise disparate individuals and groups that form to solve “public policy problems affect the environment, economy, or community,” 2) defined by a geographic place and as a coalition who work and plan in terms of watersheds or landscapes, 3) citizen leadership with active participation in the decision making process (p.3).

undertaking, help the group build a reputation for achieving results and on-the-ground implementation (Weber 2013). This highlights the importance of setting priorities and taking a pragmatic approach to choosing problems and the organizations and people the collaborative conducts business with. In some instances, the group must forego short-term benefits for potential long-term gains, just as in the case of individual actors (Ostrom 1990). Collaborative groups that focus on “small wins” or mini victories tend to enter into a reciprocal, positive feedback loop of enhanced collaboration (Ansell and Gash 2008).

Whereas mini victories can work to build trust, power imbalances within the collaborative group can undermine trust, representing an important challenge facing collective action processes (Zellner et al. 2012, Ansell and Gash 2008, Dietz et al. 2003). Certain groups or individuals, often those who are centrally located in a collaborative, are likely to have high influence, a strong perspective of others views, and can control information flow (Bodin and Prell 2011). Problems associated with power imbalances are exacerbated by collaborative arrangements whose collective interests do not align with individual members interest and when stakeholders do not have the information or training necessary to discuss highly technical issues (Ansell and Gash 2008). Yohe and Tol (2002) argue that the availability of resources and their distribution across the population affects the capacity of the group to adapt to changing conditions.

Incentives to participate include those motivating factors that shape individual involvement. Typically, collaboration is voluntary therefore, if stakeholders can achieve the same goals individually, they are not likely to be motivated to engage in collective action (Ansell and Gash 2008). Opportunities for successful collaboration increase if there is high interdependence among stakeholders. Ansell and Gash (2008) point out that “interdependence fosters a desire to participate and a commitment to meaningful collaboration, and it is possible to build trust in situations of high interdependence” (p.563).

3.2.3 Leadership

Leadership is a critical variable in collaboration, especially in promoting positive communication, trust-building, and conflict resolution (Ansell and Gash 2008, Hahn et al. 2006, Ostrom 1990). Leaders are the local champions and capacity builders that engage a diverse range of stakeholders, are responsive to social and biophysical conditions, facilitate good communication, listen intently, and work to understand all sides of an issue (Weber 2013, Walker et al. 2006b). “Leadership is widely seen as a critical ingredient in bringing parties to the table for steering them through the rough patches of the collaborative process” (Ansell and Gash 2008, p.554). The availability of leaders that have the characteristics and skills to effectively manage, often contentious, land management collaborative organizations are highly contingent on local circumstances (Ansell and Gash 2008). Ryan (2001) identifies three parts of collaborative leadership that contribute to success. First, the leader manages the process of collaboration within the mutually agreed upon institutional design. Second, the leader maintains credibility and is a source of objective information, particularly

on technical matters. Third, the leader empowers the collaborative group to make decisions that are grounded in local and scientific knowledge and work to achieve the larger collective action goals.

3.2.4 Institutional Design

Institutional design is the process of collaboration that centers on the development of and commitment to a shared vision (Ansell and Gash 2008). Institutional design refers to the “basic protocols and ground rules for collaboration, which are critical for the procedural legitimacy of the collaborative process” (p.555). This is critical because the process of collaboration depends achieving a balance between communication, trust, commitment, understanding, and outcomes. Further, Yohe and Tol (2002) find that the structure of institutions and the decision criteria used in setting priorities influences the capacity of the group to adapt to changing conditions.

The decision making process relies on respectful, face-to-face interaction among a diverse set of stakeholders and the use of knowledge, both scientific and traditional, to establish a shared understanding of the problem and potential solutions, and a commitment to the collaborative process (Weber 2013, Ansell and Gash 2008). Face-to-face dialogue works to break down barriers and is core to building trust, developing a shared understanding of the problem and potential solutions, and developing a commitment to the overall collaborative process (Ansell and Gash 2008). A shared understanding of the problem, including the setting and context, allows the group to begin thinking about what may help solve the challenges at hand. The success or failure of a collaborative is influenced by stakeholders’ level of commitment to the process. Consistent participation and cooperation in the decision-making process help to achieve buy-in among participants and continued involvement (Weber 2013, Ansell and Gash 2008).

Process transparency is also critical in effective institutional design and to the long-term collaborative success (Ansell and Gash 2008). Actors need to know that the negotiations that take place are not subverted by backroom deals or are anything other than what the collaborative agrees upon. Transparency may also be enhanced through the development of formal binding collective choice rules (Weber 2013). Formal rules help govern the collaborative process, keep stakeholders on the same page, and develop social norms. Participant norms should reflect the shared vision and goals of the collaborative. This can be written, take the form of shared power, or be represented by an active monitoring strategy (Weber 2013).

Through the establishment of social norms there is increased efficacy in inspections through more appropriate actor behavior (Bodin and Prell 2011, Dietz et al. 2003). In some cases, social capital has fostered monitoring, sanctioning, and conflict resolution and facilitated the agreement of rules and norms (Bodin and Prell 2011). Networks of civic engagement, for example, have been found to foster social norms centered on trust and reciprocity (Putnam 1993). Through trust building and the development of social capital, compliance rates can increase, thus lowering monitoring costs (Dietz et al. 2003). “In general, one can say that a necessary but not

sufficient condition for the emergence of effective norms is action that imposes external effects on others” (Coleman 1988, p.105). Rule compliance can be induced if there are established rules that govern the use of resources and a legitimate authority capable of ensuring that those who violate the rules are punished (Dietz et al. 2003). In cases of voluntary approaches to compliance, “success appears to depend on the existence of incentives that benefit leaders in volunteering over laggards and on the simultaneous use of other strategies, particularly ones that create incentives for compliance” (Dietz et al 2003, p.1909).

In cases where public policy or public management is the focus of the collaborative group, it is critical that institutions or public agencies are active participants (Weber 2013). Agencies should take a non-confrontational approach to engaging in the collaborative and recognize that collaboration is not just consultation, but an approach to work together to achieve collective action goals (Weber 2013). State and non-state actors need to work together and bring their respective resources to bear on the issue at hand in order to be successful (Ansell and Gash 2008). Relationships with higher powers or the powers that be can be critical, yet autonomy is still important, so collaborative groups will be successful if higher powers can either endorse their activities or not get in the way (Weber 2013). Coalitions with government actors tend to be more powerful, in part, because government decisions are often more binding and backed by more legitimate force (Adam and Kriesi 2007). Olsson et al. (2008) found that in the case of the Great Barrier Reef, gaining political support is a key shift toward ecosystem based management and that enabling legislation is essential but not sufficient in encouraging a shift towards collaborative adaptive style management strategies.

3.3 Collaboration in Social-Ecological Systems

Central to the theory and practice of collaborative governance and of critical importance in complex social-ecological systems are the concepts of social capital, social networks, and adaptive management. The capacity of collaborative networks to build social capital, work across a diverse range of stakeholders within the network, and actively work to manage the system based on scientific information and data, enhances the systems resilience to exogenous shocks. The following sections shed light on these important concepts as they relate to collaborative governance and collective action.

3.3.1 Social Capital and Collective Action

Coleman (1988) introduced the concept of social capital¹¹, which he views as inextricably linked to the relationships between people and social structures. Social capital is defined as the relationships or network ties that foster trust and reciprocity and facilitate mutual aid, coordination, and cooperation among the members of a community (Bodin and Prell 2011, Putnam 1993, Coleman 1988). Social capital is

¹¹ Capital is used as a general concept because of its utility in summarizing and categorizing important factors that characterize similar concepts into a single form (e.g. social, human, natural, physical, built, etc.) (Lee 2014).

based on the premise that social networks have value and that they contribute to the productivity of individuals and groups (Putnam 2001).

Social capital is a resource, that is established and built up through social activities, and whose value depends on the social organization of relationships within a given community (Putnam 1993, Coleman 1988). Actors tend to develop relationships purposefully and expand their networks based on social and economic stimuli (Diani 2011, Coleman 1988). Every type of social relation and social structure, regardless of their formal or informal purposes, facilitates some form of social capital (Coleman 1998), and this capital is transferrable from one social environment to another (Putnam 1993).

Coleman (1988) identified three different types of social capital: obligations and expectations, informational channels, and social norms. Obligations and expectations are rooted in the level of trust in the social environment and allow actors to call upon each other in times of need. A concentration of obligations represents social capital that can be used to the advantage of the actor who holds them, but may also have larger benefits to the community. Informational channels are the capacity of the social structure to share news and information. The acquisition of information can, at times, be costly, but in general, information serves as the basis for action. Social norms are a powerful, albeit often fragile, form of social capital that is important in establishing boundaries on behavior and activities within a social structure. Norms are important in overcoming problems associated with public goods, facilitating action, and conversely at constraining other actions (Diani 2011, Coleman 1988).

Opportunities for collective action are enhanced through the development of social capital because trust, norms, and networks hold potential “stocks” of social capital that can be accessed to deal with immediate and future collective action challenges (Lee 2014, Walker et al. 2006b, Putnam 1993). Social capital is an important concept in collective action literature, especially in natural resource governance, where trust and reciprocity lowers transaction costs and is often necessary to facilitate action (Bodin and Prell 2011, Lubell 2002, Ostrom 1990). Trust reduces transaction costs, resulting in conditions more conducive to collective action (Bodin and Prell 2011, Lubell et al. 2002, Ostrom 1990). Successful collaboration can increase the level of social capital in a community and enhance connections and trust within the social structure (Putnam 1993). In fact, Putnam (1993) argues, stocks can only be built up through the use and practice of collective action and the failure to utilize social ties results in the loss of capital. This strongly suggests that the practice of problem solving in established networks enhances the group’s resilience to future exogenous shocks.

Once trust is established in a relationship, the costs and risks associated with breaking that individuals trust are heightened (Putnam 1993, Coleman 1988). Coleman (1988) examined diamond traders in New York City and found that, the “strength of these ties makes possible transactions in which trustworthiness is taken for granted and trade can occur with ease. In the absence of these ties, elaborate and expensive

bonding and insurance devices would be necessary – or else the transactions would not take place” (p.99). The diamond traders in this case stand to lose family, community, and religious relationships if they break the trust of fellow traders. Coleman’s (1988) example sheds light on the importance of tie strength, a concept that is further elaborated on in the following section.

Enhancing “communities capacity to deal with stress and shocks” relies on The combination of social capital and its reliance on collaboration creates “opportunities for diverse social groups to build relationships of trust, be inclusive, and provide access to broader decision-making processes” (Bojórquez-Tapia and Eakin 2012, p.154)—and this provides a direct link to resilience, which “emphasizes the capacity to absorb stress and reorganize” as opposed to managing a system for the highest possible efficiency or output (Goldstein 2012, p.7). The social capital found in successful collaboratives can overcome some of the shortcomings of individual decisions that degrade resilience (Kaufman 2012). As well, Newman and Dale (2005) argue that in order to maintain resilience community-based collaborative decision-making institutions should be designed to include a diverse range of participants from the beginning, recruitment strategies should be aimed across a range of potential participants, the age classes represented in the group should be broad, new leaders should emerge and there should be turnover on a regular basis of key positions, formats for participation should vary (e.g. face-to-face, online), and the group should foster continued engagement of diverse members by advocating the social and intellectual benefits of such involvement, recognizing the important effects on the overall network.

3.3.1a Bonding and Bridging Ties

Bonding and bridging ties represent broad types of relationships between actors within a social structure. Bonding ties often referred to as “strong” ties, describe the more exclusive relationships between relatively homogenous actors, which are critical in building cohesion between actors (Putnam 2001, Granovetter 1973). Bridging, or weak, ties, on the other hand, are those that connect actors that subsist in otherwise separate social structures or networks and are more likely to exist between demographically heterogeneous actors (Bodin and Crona 2009, Putnam 2001). Weak ties are often characterized by the transaction of information, knowledge, and resources (Diani 2011). Overall, “[a] healthy mixture of bonding and bridging ties will create a resilient blend of local support and dedication and links to external resources” (Newman and Dale 2005, p.82). The “healthy mixture” also contributes to the ability of collective action groups to sustain them over time (Bodin and Crona 2009, Newman and Dale 2005).

Bonding ties provide strong links within a community that promote frequent information exchange and are important in building trust (Bodin and Crona 2009, Putnam 2001, Ostrom 1990). Ostrom (1990) argues that bonding ties are critical in natural resource governance because they promote the quick transfer of knowledge and information within relatively homogenous social structures. However, bonding ties can hinder innovation by “cutting off actors from needed information” and

“imposing social norms that discourage innovation” (Newman and Dale 2005, p.82). For example, in networks that are composed primarily of bonding ties, opinions that vary considerably from the majority or the status quo are likely to be shunned. Granovetter (1973) argues that bonding ties from an individual’s dense network and that “no strong tie is a bridge,” in other words, bridging ties are primarily weak ties, which form an actor’s less dense network and connect her to otherwise distant actors.

Bridging ties are important in the diffusion of knowledge and information across otherwise independent groups, and provide access to resources not readily available in the immediate social structure (Bodin and Crona 2009, Carlsson and Sandstrom 2008, Newman and Dale 2005, Granovetter 1973). Those resources, such as novel ideas and information, often serve as important tenets in initiating and maintaining collective action, enhancing the capacity for innovations and integration, and finding solutions to complex problems (Bodin and Crona 2009, Newman and Dale 2005, Granovetter 1973). Schneider et al. (2003) found that in bridging networks, actors have more positive beliefs in collaborative processes, more trust in the governance processes, and more confidence in the groups ability to solve problems. Further, networks that have a diverse range of individuals that can bridge gaps within a social structure are also thought to be higher performing¹² (Diani 2011, Carlsson and Sandstrom 2008).

3.3.1b Heterogeneity and Homophily

Bonding ties are often rooted in personal relationships, while bridging ties are those that are centered on interests that transcend personal ties. Homophily in the context of sustainable natural resource governance is the “tendency of groups to form from similar actors and then become more similar with time” (Carlsson and Sandstrom 2008, p.79). In other words, those who have similar socio-demographic backgrounds, religious affiliations, or shared experiences tend to be more inclined to develop relationships than individuals from different backgrounds. Homogeneity reduces resilience, in part, due to the lack of bridging ties in a network (Holling 1973).

If an organization seeks to ensure effectiveness in the long-run, it is paramount to account for the potential effects of homophily (Newman and Dale 2005). Groups will be more effective in the long run if they draw from a diverse range of participants who maintain a broad source of capital and experiences. Heterogeneity within a network is a key factor in the resilience of the system because a more diverse range of participants implies a more diverse range of functional traits, knowledge bases, and perspectives, which enhances the capacity of the group to develop innovative ideas and ensure inclusivity in the decision making process (Diani 2011, Carlsson and Sandstrom 2008, Bodin et al. 2006, Newman and Dale 2005). This is a factor that is largely synonymous with the inclusivity principle in collaborative governance, where

¹² Bridging ties are arguably more critical to the resilience of a system because they are the source of innovation, new ideas, and external resources that are relied upon in times of change and adaptation. “[B]ridging ties enhance the capacity for innovations and for finding solutions to complex problems, and thus adaptive capacity” (Bodin and Crona 2009, p.370).

a broad base of often-disparate stakeholders comes together to address transboundary problems.

3.3.1c Sense of Place

Sense of place, also referred to as “place attachment,” is the concept used to describe people’s connections to a location or environment (Cheng et al. 2003). In some cases, sense of place is tied to an identity of local resource use where actors directly or indirectly depend on natural resources to support their livelihoods and quality of life (Lubell et al. 2002, Daniels and Walker 2001). A stable population enhances sense of place, and a shared sense of place reduces transaction costs because of the local knowledge that informs decision-making and opportunities for engagement in community activities and civic life (Lubell et al. 2002). Ansell (2003) found that organizations that are oriented towards place, as opposed to issue-based groups, are more inclined to view collaboration positively. This is due, in part, to the fact that local groups working on place-based issues are more likely to have regular face-to-face relations and a shared dialogue around territorial residence and proximity (Ansell 2003). Daniels and Walker (2001) conducted a case study of collaborative learning and fire recovery planning on the Wenatchee National Forest in central Washington and found that the local communities connection to the forest, whether economic, recreation, or spiritual, brought people together following the fire.

Embeddedness is a related concept that is defined as the degree to which an individual or organization is entrenched within a social network (Ansell 2003). The embeddedness of actors within the community often grants them the trust and reciprocity necessary to make decisions in light of polarized opinions or politics (Diani 2011, Ansell 2003). Diani (2001) found that “[e]mbeddedness in social networks not only mattered for recruitment, but it also discouraged leaving, and it supported continued participation, with substantial bandwagon effects” p.223). Embeddedness has also been shown to have a positive influence on an actor’s attitudes toward collaboration and is primarily related to an actor’s decision to engage in collective action (Diani 2011, Ansell 2003).

3.3.2 Adaptive Management

“The challenge for a social-ecological system is to accept uncertainty, be prepared for change and surprise, and enhance the adaptive capacity to deal with disturbance” (Hahn et al. 2006, p.575). Change is often viewed as a threat to the status quo, and socially there is a focus on not changing as opposed to expecting to have to change (Butler and Goldstein 2012). In many cases a perpetuation of the status quo is a result of sunken costs that distort political and social views of the value of new investments or of abandoning broken policy, which ultimately means fewer opportunities for innovators to make a difference (Walker and Salt 2006). Further, the adoption of a new regime requires innovative thinking, technical skills, collaborative agreement, and social and natural capital (Walker et al. 2006b).

Change awareness and preparation requires resource users to anticipate often-unexpected disturbances or shocks and be aware of how different regime shifts may

alter ecosystem function and socio-economic conditions (Hahn et al. 2006). Adaptive strategies to deal with external drivers, change, and surprise foster the resilience of the system and prepare resource users to respond to an exogenous shock (Hahn et al. 2006, Folke et al. 2005). An adaptive and flexible approach is necessary, in large part, because our understanding of complex social-ecological systems is often incomplete (Bodin and Prell 2011, Hahn et al. 2006).

Adaptive management is defined as the systemic use of monitoring and evaluations to conduct experiments and learn from those experiments in order to better inform management strategies (Bojórquez-Tapia and Eakin 2012, Schultz and Coelho 2012, Hahn et al. 2006). Effective adaptive management relies on the willingness of participants and decision-makers to embrace the uncertainty and lack of understanding of the complex interactions that take place within social-ecological systems and support flexible institutions to apply new knowledge and adjust management strategies over time as learning occurs (Bojórquez-Tapia and Eakin 2012, Bodin and Prell 2011). Adaptive co-management (ACM) is a type of active adaptive management that integrates the social learning characteristics of adaptive management with the sharing of management authority across public and private institutions that characterizes collaborative governance (Bodin and Prell 2011, Walker et al. 2006b).

Adaptive co-management is the process through which private and public actors, across various levels, collectively manage natural resource issues (Carlsson and Sandstrom 2008, Hahn et al. 2006, Walker et al. 2006b). Adaptive co-management can be found in places where local collaborative groups self-organize, learn from experiments and try new management practices, collect and share ecological information and knowledge, and are supported from government and other authorities at various levels to resolve conflict (Carlsson and Sandstrom 2008, Hahn et al. 2006). Adaptive co-management can facilitate adaptability and resilience and is enhanced by purposeful and thoughtful experimentation on the landscape (Walker et al. 2006b).

Adaptive co-management relies on a common desired state among collaborative participants (Bojórquez-Tapia and Eakin 2012). According to Bojórquez-Tapia and Eakin (2012), the desired state includes: 1) “how resources will be used, managed, and conserved”, 2) “how rules about use and management will be implemented and enforced”, and 3) “how conflicts and disputes can be resolved” (p.158). Finding a desired state through collaborative, participatory processes result in social learning and institutional organizing around a common idea (Bojórquez-Tapia and Eakin 2012). However, this does not necessarily translate into a more resilient system. Under conditions of uncertainty and in the face of unpredictable exogenous shocks, adaptive approaches to ecosystem management can drive synchronization or resilience towards only one type of exogenous shock (Walker et al. 2006b).

In coupled social ecological systems, adaptive co-management has been responsive to environmental change and brought new knowledge and information into natural resource management networks (Bodin and Crona 2009). Adaptive co-management in

these systems is rooted in the capacity of actors to influence the structural and functional characteristics of the ecosystem and the social environment (Walker and Salt 2006, Smit and Wandel 2006). Further, Gunderson (1999) purports that “if there is no resilience in the ecological system, nor flexibility among stakeholders in the coupled social system, then one simply cannot manage adaptively” (p. 2). The critical factors in successful adaptive co-management include resource literacy, information provision, and the incorporation of new knowledge; embracing and maintaining functional diversity; and effectively working across institutions at multiple scales. Each of these is discussed in more detail below.

Next, the essay turns to the larger public policy context, beginning with U.S. Federal Forest Policy and the history of fire suppression on the landscape. The results of this century-long policy are discussed as well as the need for ecological restoration. Ecological restoration is increasingly being developed and implemented through collaborative processes, as a mechanism to reduce the risk of litigation, catastrophic wildfires, and to return ecological resilience to the forest. In the context of the Lakeview Stewardship Group, ecological restoration serves as a critical component in meeting socio-economic and ecological goals.

4. POLICY CONTEXT: U.S. FEDERAL FOREST POLICY

The Forest Service was established in 1905 within the United States Department of Agriculture. Shortly after the birth of the agency, the “Big Blowup” fires of 1910 destroyed 3 million acres of forests across Montana, Washington, and Idaho in matter of only a few days (firehistory.org). This resulted in a series of policies that advocated for fire suppression on federal forestland, largely in the name of timber production. Today, that policy persists, yet the need to restore forest ecosystems through ecological restoration has likely never been greater in the American West.

The strong focus on fire suppression has failed to reduce the risk of burgeoning fuel loads, leading to some of the largest and most catastrophic fires in history. The five biggest fire years in terms of total acreage have all occurred since 2004 (Schwedler 2011, NIFC 2013). And, between 1985 and 2012 the number of acres of forestland burned in the U.S. has dramatically increased, illustrated below in Figure 1. Ultimately, the increase in size and severity of wildfire has put more people, communities, and infrastructure at risk, and significantly increased the cost of suppression efforts (Steelman and Burke 2007).

4.1 Fire Suppression

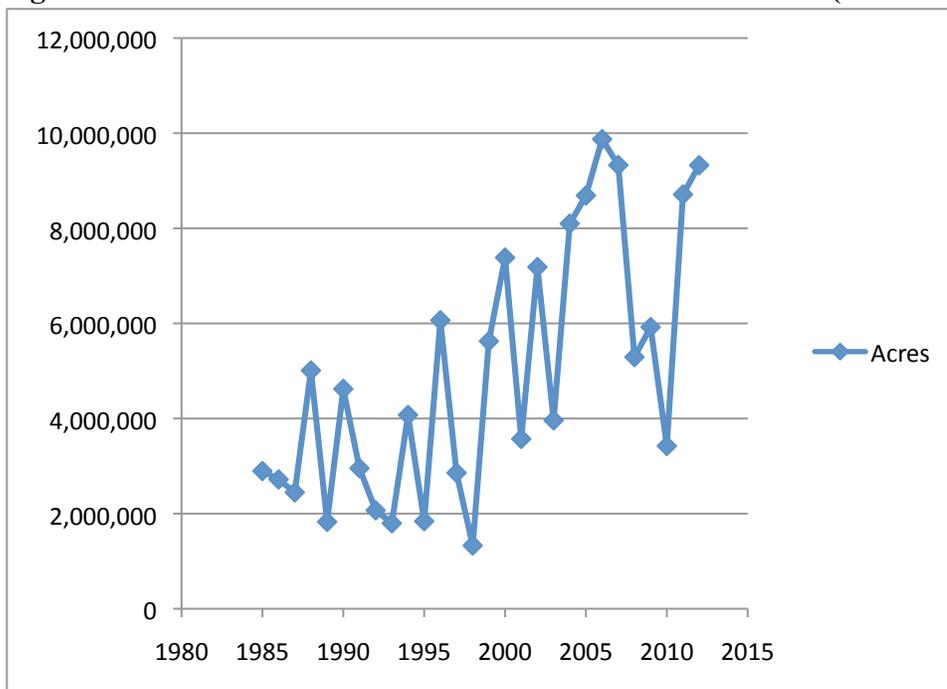
Fire suppression has been the dominant policy choice of federal land management agencies for the last century and increasingly represents a significant monetary burden. In fiscal year 1991, fire suppression made up 13% of the total Forest Service budget, and by fiscal year 2012, fire suppression consumed 40% of all agency spending (NASF 2013). In each of the last ten years the Forest Service has spent over a billion dollars annually on fire suppression (Ellison et al. 2012; NIFC 2013). And, between 2004 and 2008 alone the Forest Service spent \$2.25 billion on 360 wildfires in the American West, not including fires that cost less than \$1 million to fight

(Ellison et al. 2012). Figure 2 below illustrates the annual changes in federal spending on fire suppression beginning in 1985.

This trend in the growth of fire suppression costs has put tremendous budgetary pressure on other agency priorities. For the last two decades, the USFS has borrowed money from various line items to fund fire suppression activities (Butler and Goldstein 2010). Between 2002 and 2012 the Forest Service transferred \$2.8 billion from non-suppression line items to fighting wildfires (NASF 2013). This constrains the ability of the agency and reduces the effectiveness of forest restoration efforts (Butler and Goldstein 2010).

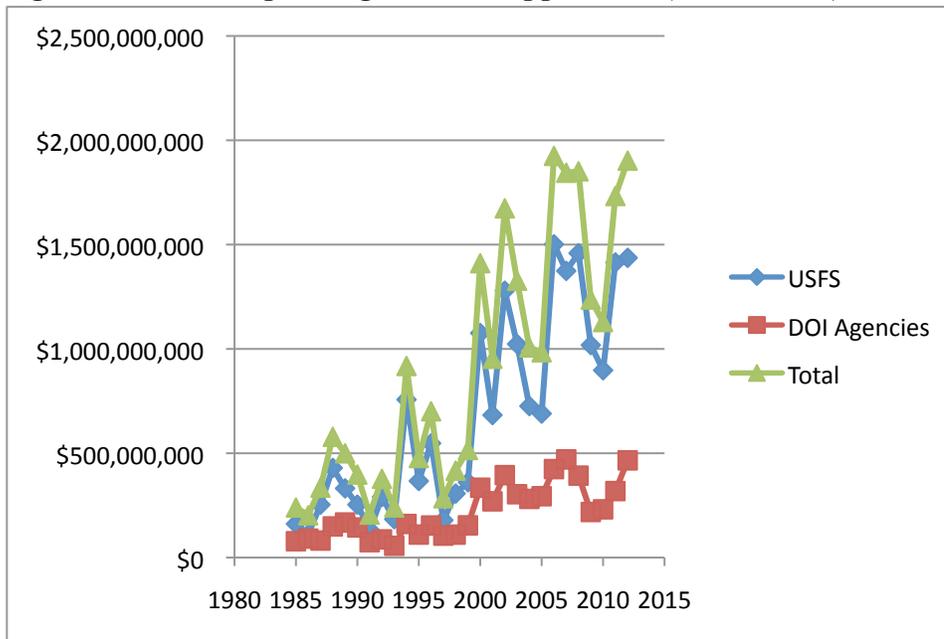
At the same time, the dominance of fire suppression policy, along with other traditional land management approaches used by the USFS, has created problems for many Western U.S. forests. In the Pacific Northwest, for example, dry forest ecosystems have been subjected to over 100 years of fire suppression, grazing, and plantation establishment, resulting in conditions well outside of the historical range of variability (TNC 2012). In general, this has resulted in fewer old growth stands, more dense and overstocked forest conditions, and more susceptibility to uncharacteristic high severity wildfire, disease, and insect epidemics (Franklin and Johnson 2012, TNC 2012). Moreover, The Nature Conservancy (TNC 2013a) estimates that over 120 million acres of public forestland are in need of restoration across the United States. And, the U.S. Forest Service (2012b) estimates that 65 million acres of national forestland are at high or very high risk of catastrophic wildfire.

Figure 1: Public and Private Forestland Burned in Wildfires (1985 – 2012)¹³



¹³ Data presented is from the National Interagency Fire Center (NIFC 2013), which includes all private, federal, and state lands in the United States.

Figure 2: Federal Spending on Fire Suppression (1985 – 2012)¹⁴



The degraded status of federal forestlands has led to a concerted push for ecological restoration. Ecological restoration aims to return the ecosystem to the natural range and variability of fire while improving habitat for wildlife, protecting watersheds, and reducing the risk of invasive species (Steelman and Burke 2007). Ecological restoration as a policy approach has been touted as a solution at all levels of the Forest Service (USFS 2012b) and generally receives high levels of public support (Franklin and Johnson 2012). As part of this, an explicit goal of the management of dry forest ecosystems in the American West is to return the landscape to a fire-adapted resilient state. Dry forest restoration strategies call for reduced stand densities, retention of old trees, a shift in forest composition towards fire and drought tolerant species, and the incorporation of spatial heterogeneity at multiple scales (Franklin and Johnson 2012). Increasingly, federal land managers are working across traditional socio-political boundaries to engage a diverse range of stakeholder groups in collaborative land management processes that aim to build consensus around forest restoration strategies.

However, ecological restoration is an especially daunting challenge to achieve at meaningful scales because of the extent of the problem and the fact that the federal policy is fully engrained in federal land management agencies. Butler and Goldstein (2010) argue that fire management in the US is in a rigidity trap, in other words, it suffers from “an inability to apply novel information and innovation in the midst of crises,” which prevents stakeholders from responding effectively to the complex or wicked problems associated with landscape scale forest ecosystem restoration. Wildfire policy continues to be dominated by fire suppression because of the structure of land management agency budgets, congressional funding priorities, federal

¹⁴ NIFC 2013

performance measures, and traditional bureaucratic and administrative practices (Steelman and Burke 2007). Restoring resilience to forest ecosystems through mechanical thinning and prescribed fire holds promise to reduce the costs associated with fire suppression, enhance ecosystem health, increase beneficial ecosystem services such as water production, and can be conducted in such a way that fosters the socio-economic well-being of rural communities surrounding national forestland. One way that ecological restoration strategies have gained support from a broad base of stakeholders is through the facilitation of collaborative processes that aim to build consensus around land management goals.

4.2 Collaboration and Ecological Restoration

Collaboration can be seen as a mechanism to build public trust through formal consultation in the planning process. In the context of ecological restoration, collaboration among federal, state, local, tribal, and private landowners and community members has been used in an attempt to reduce the burden of the National Environmental Policy Act (NEPA), decrease the risk of litigation, and reorient fire management towards ecological restoration, fuels reduction, and community protection (Goldstein and Bulter 2010b). Research has shown that collaboration has been shown to facilitate effective NEPA planning, increase the number of acres treated through ecological restoration, enhance collaborative capacity and funding opportunities, and led to self-sustaining networks that share best practices and innovation (TNC 2013b, Goldstein and Bulter 2012, TNC 2012). Goldstein and Butler (2010c) argue that collaboration has set the stage for transformational change, providing opportunities to break the fire suppression rigidity trap and foster landscape, regional, and national cohesion around fire management issues.

Ecological restoration is often referred to as a wicked or complex problem, which manifests across multiple scales and transcends traditional social and political boundaries that cannot be resolved through traditional governance approaches (Goldstein and Butler 2010a). Relative to fire suppression, collaborative approaches represent a low-cost, “customized, contextually relevant” and “topical” treatment to the ecosystem at hand, which makes it particularly effective in the ecological restoration problem setting where working across landscapes requires innovative approaches that can be adapted across social, economic, ecological, and political scales (TNC 2012). Two collaborative approaches that have been implemented by federal land management agencies in the U.S. include the Fire Learning Network (FLN) and the Collaborative Forest Landscape Restoration Program (CFLRP).

4.2.1 Fire Learning Network

The Fire Learning Network (FLN) was established in 2001 when The Nature Conservancy (TNC), the U.S. Forest Service (USFS), and the Department of Interior (DOI) signed a memorandum of understanding to invest in a system of “landscape-scale collaborative projects that work to accelerate the restoration of fire-adapted ecosystems at local, regional and national scales” (TNC 2012, p.1). Through FLN, selected forests have the opportunity to participate in two-year planning processes that brings together often-disparate stakeholders to share knowledge, develop goals,

and implement strategies, and then work together to monitor progress (Goldstein and Butler 2010a). The group at the center of this case, the Lakeview Stewardship Group, attained FLN status in 2011.

In a series of papers by Goldstein and Butler (2010a-c), the authors describe how FLN enhances social-ecological resilience by building cohesion and a shared identity, developing the knowledge and skills to support restoration work, and by enhancing the community's capacity to restore fire-adapted forest ecosystems.

FLN is an adaptive strategy that builds on the knowledge of on-the-ground participants in different contexts - economically, ecologically, politically, and socially - to increase the use of prescribed fires, mechanical thinning, and management of wildfires for resource benefits (TNC 2013). Network partners include federal, state, local, tribal, and private landowners and community members. Participants engage in the process because it helps them build credibility with their partners and it allows them to reach goals more quickly than by working alone (TNC 2012). Similar to collaboration in other natural resource settings, partners coalesce around a common problem and determine a best route of action based on shared interests.

FLN has “obtained recognition from government agencies and independent researchers as an effective approach to responding to the institutional crises of wildfire management” (Goldstein and Butler 2010c, p.121). “By sharing experiences, challenges, and successes with each other, network participants learn about ways to address complex challenges, overcome organizational and social barriers, and apply novel fire restoration techniques on their own landscape” (Goldstein and Butler 2010c, p.123). Three key factors are cited in the programs current success: 1) restoring fire-resilience landscapes, 2) building fire-adapted communities, and 3) enhancing social and operational capacity to effectively respond to wildfire (TNC 2013). The data show, and on-the-ground evidence suggests that early adopters have developed into advanced networks and are quickly scaling up efforts to address larger issues across the landscape (TNC 2012).

Early adopters of FLN have developed into advanced networks and have quickly scaled up efforts to address larger issues across the landscape (TNC 2012). Between 2002 and 2011, FLN encompassed 15 regional networks, 162 million acres, and more than 1,125 individual partners across 39 states (TNC 2012). Collectively, 490,000 acres have been treated and over \$27 million was raised to support land management, representing an importance contribution to restoration efforts (TNC 2013c). Three FLN sites in the Pacific Northwest have been selected for CLFRP funding¹⁵. In 2010, the Deschutes Skyline and Tapash Sustainable Forest Collaborative were selected. In 2011, the Lakeview Stewardship Landscape was selected.

Currently, there are no documented studies in the peer-reviewed literature that examine the link between FLN and CFLRP. In the case of the Lakeview, there is not

¹⁵ FLN projects that have received CFLRP designation include the Southwest Jemez Mountains, Ozark Highlands, Shortleaf-Bluestem Community Project, and the Grandfather Restoration Project.

significant overlap between the membership of the CFLRP-funded collaborative and the FLN. The facilitator of FLN is a core-member of the collaborative, but otherwise membership overlap is limited. It is unclear what role, if any, the FLN plays in the success of CFLRP-funded projects.

4.2.2 Collaborative Forest Landscape Restoration Program

The Collaborative Forest Landscape Restoration Program (CFLRP) was established in 2009 as part of the Omnibus Public Lands Management Act (Schultz et al. 2012). The program provides communities with the opportunity to collaborate with the Forest Service in landscape scale planning and restoration. The overarching goals of the CFLRP are tripartite, or to enhance the ecological, economic, and social sustainability of forests and the surrounding communities with a strong emphasis on the reduction of the cost and risks associated with catastrophic wildfire. The program works to accomplish these goals through the use of local resources and a competitive grant program funded by the federal government (Schultz et al. 2012).

CFLRP funded its first projects in 2010, and immediately began to promote job stability, work to ensure a reliable wood supply, and enhance forest health (USFS 2012a). The CFLRP funded projects have created and maintained 3,375 jobs in fiscal year 2011 and 4,574 jobs in fiscal year 2012. The program is responsible for the sale of 94.1 million cubic feet of timber and the production of more than 1.15 million green tons of biomass. In total, more than 1.149 million acres have been treated to reduce the risk of mega-fires and improve wildlife habitat. In addition, more than 6,000 miles of roads have been remediated or decommissioned and 394 miles of fish habitat have been restored across the nation.

Region 6 of the Forest Service is coordinating with Sustainable Northwest, a non-profit based in Portland, Oregon, to bring together experts and practitioners from each of the CFLRP funded projects to identify core needs of collaborative groups, and share challenges and successes in the planning and implementation of restoration projects (SNW 2013). Sustainable Northwest organizes an annual meeting that brings together CFLRP-funded projects to share success stories, exchange ideas and information, build relationships, and work to overcome challenges that transcend individual landscapes. This region-wide group has explored important topics including the development of innovative stewardship contracts, the efficiency of the National Environmental Policy Act (NEPA) process, public-private partnerships, and inter-agency coordination (SNW 2013).

In both the case of CFLRP and FLN, collaborative groups must navigate the NEPA planning process as it relates to ecological restoration, and work with federal land management agencies in such a way that ensures that the Federal Advisory Commission Act (FACA) will not be violated.

4.2.3 Navigating NEPA and FACA

The National Environmental Policy Act (NEPA) provides accountability and a legally binding framework in the ecological restoration planning process. NEPA requires

public meetings, provides opportunities for the review and public comment periods for proposed projects, and enhances the ability of stakeholders to administratively and legally challenge agency decision-making. Butler (2013) argues that NEPA “set the stage” for more collaboration in land management decisions on federal forests by providing more opportunities for public involvement.

The NEPA planning process for forest restoration projects is occurring, increasingly, on a landscape scale. Collaborative groups, such as Four Forest Initiatives, one of the original funded CLFRP projects, have been working on a 750,000-acre planning area under a single Environmental Assessment (EA) document. Butler (2013) points out that it is clear from agency documents and speeches that collaboration is an integral part of Forest Service dialogue with the public. Collaborative groups play an important role in providing feedback on proposed decisions, working to establish zones of agreement, and discussing project specifications. Yet, more effective planning is still butting up against the onerous task of meeting regulatory requirements, which take as many as 5 years from the planning stage to implementation.

For federal land management agency personnel, a central point of contention lies between their participation in collaborative recommendations and their autonomy in the decision-making process (Butler 2013). Federal legislation, namely the Federal Advisory Committee Act (FACA), regulates the role and level of involvement that federal employees can have in the collaboration. As collaboration has become more important in planning and management, the Forest Service has had to face the inherent challenges associated with maintaining decision-making authority and adhering to FACA.

The Federal Advisory Committee Act (FACA) was designed to ensure transparency in decision-making where federal agencies are involved and ensure representation of public interests on advisory committees (Butler 2013, p.17). The Council of Environmental Quality (CEQ) outlines FACA guidelines, which includes three criteria that must be met for FACA to apply: 1) the group is established by the federal agency and the agency has some level of control over the group, 2) the group has members who are not federal employees, and 3) one of the products of the collaboration is formal advice or a recommendation to the federal agency involved. If and when these conditions are met, the agency’s role in the advisory committee may come under internal or judicial review. The law, however, is well documented as being ambiguous, which often results in local interpretations by agency staff members and collaborative groups (Butler 2013, Wondolleck and Yaffee 2000). In the context of the forest collaboration, members have experienced various degrees of success in navigating FACA, sometimes at the detriment of progress towards restoration goals (Butler 2013).

The Forest Service plays an important role as the decision-maker regarding land management strategies, and the agency involvement in the collaborative can be indicative of the ability of the group to move effectively towards outcomes (Butler

2013). Research has shown that government agencies are often central players in natural resource collaboration (Carlsson and Sandstrom 2008, Scholz and Wang 2006). Ansell and Gash (2008) suggest that leadership from public agencies in collaborative arrangements is an important tenet in implementing collaborative decisions.

Butler (2013) examines how forest service personnel are involved in the collaborative process in the context of the first ten funded Collaborative Forest Landscape Restoration Program (CFLRP) projects. The author develops four typologies - leadership, membership, involvement, and intermittence - based on two dimensions of involvement, the level of integration and level of participation of the Forest Service in CFLRP groups. The “leadership” category describes cases in which the Forest Service plays a guiding role and is heavily involved procedurally. In many cases, this has led to a change in the agency’s role in the collaborative due to concerns over FACA and hindered collaborative processes. The “membership” category illustrates cases where the Forest Service participates in dialogue, is procedurally integrated into the collaborative, and contributes to the decision-making process, while maintaining clear boundaries and lines of authority, which in some cases has caused tension between the agency and collaborative members. The “involvement” category is where Forest Service staff do not vote on issues or collaborative decisions, but they “participate in committee work, provide information, data, opinions, and sideboards, and engage in dialogue at all levels of the collaborative, simply stopping short of voting on collaborative decisions” (p.5). This level of integration and participation seems to enhance collaborative decision-making and minimize procedural concerns regarding FACA. Lastly, the “intermittence” category describes a Forest Service role that is not procedurally integrated or consistently involved in collaborative dialogue or decision-making, which was shown to hinder collaborative progress.

Butler’s (2013) research suggests that the “involvement” category is an optimal position for the Forest Service, where the agency is engaged in dialogue, but limits concerns about FACA violations. The results of this study show that, at least in the first ten CFLRP cases, Forest Service involvement in the procedural process of the collaborative can hamper collaborative decision-making. Instead, the Forest Service and the collaborative are best served by a decision making process that is separated from that of the agency, but open communication and dialogue with one another.

5. CASE STUDY: THE LAKEVIEW STEWARDSHIP GROUP

5.1 The Community of Lakeview: the Landscape, Socio-economic Conditions, and Federal Forest Policy

5.1.1 The Landscape

The communities of Lakeview and Paisley in South-Central Oregon lie within a 3.6 million acre forest and rangeland on a high desert ecosystem. Drought tolerant species dominate, including ponderosa pine, white fir, and lodgepole pine at higher elevations and Western juniper, sagebrush, and agricultural land at lower elevations

(USFS and BLM 2010). This area averages 17-26 inches of precipitation per year, most of which falls in the winter and spring months. June to October is the driest period, accompanied by hotter temperatures and thunderstorms. Lightning activity is common during these months, and July to September is typically considered the fire season.

78% of the land base in Lake County is publicly owned and managed, including the Fremont-Winema National Forest and Hart Mountain National Antelope Refuge. Private timberlands and ranches crisscross public lands, including, most notably, the large private timberland owned by Collins Pine Company. The company is regarded as an industry leader in environmental stewardship and maintains the largest block of forestland certified as Forest Stewardship Council (FSC) in Oregon. Collins Pine Company Fremont Sawmill in Lakeview is a critical piece of remaining infrastructure and currently employs approximately 100 employees (LSG 2011).

5.1.2 Socioeconomic Conditions

According to the U.S. Census Bureau (2010), Lake County has 7,820 residents with a median household income of \$40,049 and 17.2% of people living below the poverty line. The community is relatively homogenous with 92.9% percent white and 7.5% Hispanic or Latino. The high school graduation rate is 86.4% and roughly 20% of community members over the age of 25 hold a Bachelors degree or higher. Unemployment in Lake County was 16.3% in January of 2010, and annual average unemployment in 2012 was 12.7%. Phillips (2010) in his review of the Lakeview Federal Stewardship Unit, found that “social and economic change over the last decade [2000-2009] did not appear disruptive. There was no rapid growth or declines in the social and economic indicators reviewed for Lake County. Conditions contributing to social and economic well-being appear stable” (p.41).

Lakeview is the largest population center in Lake County with approximately 3500 permanent residents and a hub of services for the surrounding area, with local shops and businesses, a hospital, and amenities that are not available in the smaller, surrounding communities. The identity of residents in Lakeview is closely tied to natural resource use, primarily forest products and ranching. The close connection and reliance on natural resources has often resulted in tough economic times for the people of the Lakeview area, and the communities of Lake County have struggled to diversify their economies from traditional, natural resource based jobs (LSG 2011, Cheek 1996).

Lake County is very rural, remote place with no main thoroughfare or transportation corridors (Cheek 1996). The geographic isolation of Lake County presents challenges to developing more robust economic opportunities and there are significant barriers to attracting new industry. The closest airport is 90 miles away in Klamath Falls, and the railroad has a low capacity and unreliable connections. The closest freeway access is 170 miles away in Medford, and trucks over 60 feet long are not allowed to transport goods east or west on Highway 140, the main road to both the interstate and the closest population centers. Tourism is not an opportunity for significant economic

development, in large part, because of the distance to population centers and the relative abundance of outdoor recreation opportunities in the other parts of the region. Despite these challenges, Lake County has attracted some new developments. The construction of the Warner Creek Correctional Facility in 2005 was an economic boon, bringing in 140 new jobs. Renewable energy development seems to provide the most reliable long-term opportunity for economic development, with geothermal heating and photovoltaic arrays being integrated into existing and new facilities. That being said, timber and agriculture are likely to remain the most important economic mainstays in the County in the foreseeable future (LSG 2011).

5.1.3 Federal Forestry in Lakeview

The Lakeview Federal Sustained Yield Unit¹⁶, also referred to as the Stewardship Unit, was established in 1950¹⁷ under the Truman administration (LSG 2011, Cheek 1996). The Stewardship Unit is comprised of 500,000 acres, of which approximately 300,000 acres is deemed suitable for timber production (LSG 2011, Cheek 1996). The stated policy goal of the Lakeview Federal Stewardship Unit in 1950 was to harvest the full sustained-yield production¹⁸ established through the Fremont National Forest Land and Resource Management Plan. The policy statement aimed to ensure that the mills in Lake County remained open for business through the provision of a sufficient and reliable source of timber from the Stewardship Unit (Cheek 1996). If, for any reason, a local mill shuts down, the Stewardship Unit comes up for a formal review by the Forest Service.

Following the establishment of the Stewardship Unit, commodity production dominated the landscape and brought a wealth of economic activity to Lake County (Phillips 2010). Then, in the late-1960s and 1970s, under a host of new federal laws, land managers began taking a more holistic approach to forest management, recognizing multiple-use values. Whereas, timber harvest on the Stewardship Unit

¹⁷ On March 29, 1944 Public Law number 273 was passed through the 78th Congress of the United States, establishing cooperative sustained yield units (Granger 1944). The bill was introduced by Oregon Senator Charles L. McNary and worked to accomplish three primary goals. “The stated purpose of the act is to promote sustained yield forest management in order thereby 1) to stabilize communities, forest industries, employment, and taxable forest wealth, 2) to assure continuous and ample supplies of forest products, and 3) to secure the benefits of forest influences on stream flow, erosion, climatic, and wildlife conditions” (Granger 1944, p.558). Throughout the 1940s and 1950s, federal policy makers were intentional about supporting a stable supply of timber and maintaining economic prosperity that had resulted from the war effort. Sustained yield units met these policy goals and supported community stability and strong rural communities by mandating that locally harvested timber be processed by local mills (Phillips 2010, Cheek 1996). According to the legislation, the timber must be harvested and processed by local crews and mills to the greatest extent possible and timber may be sold at appraised value without a competitive bidding process (Phillips 2010, Cheek 1996, Granger 1944). The Secretary of Agriculture, through the Public Law No. 273, was granted the authority to create sustained yield units if it is deemed that the communities surrounding national forest lands are dependent upon the sale of timber from those federal lands to maintain community stability (Granger 1944). In 1957, the Forest Service abandoned the policy; formally announcing it would create no new units (Cheek 1996).

¹⁸ Maximum sustained yield may result in a highly stable system, but less resilient than historical conditions maintained (Holling 1973).

was approximately 400 million board feet per year in 1968, by the late-1980s, production at local mills had declined to approximately 60 million board feet of federal timber per year. By the early 1990's changes in public attitudes and federal environmental laws requiring endangered species protection dramatically shifted agency priorities towards conservation and critical habitat protection. These changes halted logging on federal lands and resulted in a remarkable increase in dense, overstocked stands of relatively young trees.

The reduction in timber harvests led to mill closures and socio-economic decline in Lake County (Cheek 1996). The loss of jobs associated with the timber industry is also due, in part, to developments in mechanization and the consolidation of smaller mills into larger, more vertically integrated facilities, which resulted in a low labor input requirement and drove other changes in the industry (Phillips 2010). In 1990, Lakeview supported three sawmills and the nearby community of Paisley also supported a mill. According to members of the Lakeview Stewardship Group, three of those four mills closed between 1990 and 1996 "because of the lack of timber," which was concerning to the community (Respondent 11). The closure of the mills also sparked a review of the Lakeview Federal Stewardship Unit, which was "something that people cared about and something that people thought had done good things for the community" (Respondent 5).

5.2 The Lakeview Stewardship Group

The Lakeview Stewardship Group was created in 1998, when local community leaders, with support from Sustainable Northwest, organized a meeting of scientists, environmental groups, loggers, ranchers, and citizens to explore the future of the Stewardship Unit. The intention of the initial meeting with local landowners, industry, environmentalists, and agency leaders was to discuss Forest Stewardship Council (FSC) certification and to "come meet" and "see who we are" (Respondent 5).

There were about 90 people at the meeting... We met in the forest and talked about what is important to us... Then, we met again and agreed that certification brought us all together, but it was too controversial and it wasn't the battle we wanted to fight (Respondent 5).

Environmental groups objected to certifying the Stewardship Unit, arguing that FSC certification legitimized harvest. Yet, the initial conversations led to a common set of values and shared interest in restoring ecosystem health and enhancing the socio-economic well-being of the community. A dedicated group emerged, committed to working towards common goals on the landscape. This group would come to be known as the Lakeview Stewardship Group, and according to the founding members, was developed by accident, as it was an afterthought to the primary goal of saving the community.

The collaborative was formed because we were desperate. People ask, well how'd you do it? And what's the Holy Grail? If you want to form a collaborative get absolutely down on your knees, buck naked, cold, and you

have nothing and you're desperate. I got news; you will get together with people. That's not what people like to hear, but that's the truth (Respondent 11).

The initial meeting was mired with “tension” and “distrust” with signs on one end of town reading, “Eco Nazis go home” because many blamed “the environmentalists who had shut down the work in the woods” (Respondent 4). There was a distinct “us and them,” and “[e]veryone was mad [because] we felt like we had been managing the forest well” (Respondent 5). Despite the early tensions, the group survived.

A core group of people continued to work together. A tight unit of people, we could argue each others views, and we became we instead of us and them and that was how it got started and how its been (Respondent 5).

In 2001, the Lakeview Federal Stewardship Unit was permanently reauthorized, due in large part, to the work of the Lakeview Stewardship Group. Today, the stated goals of the Unit are to sustain a restore the forest ecosystem while providing opportunities for people to “realize their material, spiritual, and recreational values and relationships with the forest” (LSG 2011, p.4). The Stewardship Unit remains an important tenet in the Lake County economy and contributes to the quality of life in the Lakeview area (Phillips 2010, Cheek 1996). Employment and income of local contractors and forest products workers are supported by timber harvested from the Stewardship Unit, and secondary manufacturing of products such as window and door frames have historically represented important employers in the forest products sector in Lake County (Phillips 2010).

In the case of the Lakeview Stewardship Group¹⁹, the Lakeview Federal Stewardship Unit represents the territorial boundaries of their work and the group operates as primarily a place-oriented, as opposed to issue-oriented, network. The collaborative meets about 3-4 times per year. There is no formal structure, committees, or executive board, and the group relies on a consensus-based decision rule. The group cannot formally manage the land, but provides recommendations to the Forest Service. It is important to note that in the context of the collaborative group, “making decisions” is in reality an iterative process that through the review of on-the-ground knowledge and monitoring data and based on the best available science, consensus around proposed projects and areas of interest are developed and then shared with the USFS. The agency, not the collaborative, retains jurisdiction and formal decision-making authority over federal lands, including the Stewardship Unit. Members of the collaborative commented on some of the aspects of the process, which “works” for the group and helps facilitate decision-making.

¹⁹ Partners in the collaborative include the Concerned Friends of the Fremont-Winema, Defenders of Wildlife, Klamath Tribes, Lake County Chamber of Commerce, Lake County Resource Initiative, Lakeview High School, Oregon Department of Economic and Community Development, Oregon Wild, Sustainable Northwest, The Collins Companies, The Nature Conservancy-Oregon, The Wilderness Society, and the USFS Fremont-Winema NF, among others.

It is actually kind of strange because we don't have a big process... We've never had to vote (Respondent 11).

Our approach is somewhat unique. We don't require a quorum of members to be present. When we have our meetings they are informative. The members speak their minds. We can provide letters of support or documentation or perspectives on different issues, but we don't actually require...formal procedures. In some ways I think that's unique in a group like that (Respondent 3).

In 2002, Sustainable Northwest and the Lakeview Stewardship Group helped to create the Lake County Resource Initiative (LCRI). LCRI serves the collaborative, providing planning and organizational capacity. LCRI is also more widely involved in economic development strategies in the community, bringing investments in renewable energy and education into Lake County.

In 2005, the Lakeview Stewardship Group published their first long-range strategy. The strategy articulates common, shared values of the members of the Lakeview Stewardship Group and serves as the basis for decision-making amongst members of the group. At its core, the strategy is based on the premise that human activities and climate change pose threats to the social-ecological system and active adaptive management is needed to restore ecosystem health and promote socio-economic well-being. Areas of shared interest include, but are not limited to, the need for accelerated thinning and prescribed fires to restore ecosystem health, the retention of old-growth trees within the unit, no new permanent roads will be built in order to meet restoration goals, and temporary roads will be decommissioned immediately (LSG 2011). The group also shares an interest in removing fish barriers and decommissioning other roads in order to improve riparian habitat.

The Forest Service contributed to the process of developing and updating the long-range strategy by providing site-specific information, reviewing drafts and providing feedback, and participating in group discussions. The strategy has subsequently been adopted in Forest Service planning documents, and has helped foster a stronger relationship between the agency and the collaborative. Overall, the document aims to support the shared goals of the collaborative and the Forest Service in effectively managing the Stewardship Unit (LSG 2011).

The Lakeview Stewardship Group's long-range strategy has contributed to the collaboratives continued success at meeting ecological and socio-economic goals. Between 2001 and 2009, 35,785 acres were non-commercial fuel reduction acres, 26,921 acres²⁰ were commercially treated, and 49,633 acres were treated with prescribed fire (LSG 2011). The Lakeview Stewardship Group places a strong emphasis on thinning and restoration treatments, which they see as the core of their work, and that will ultimately lead to increased ecological resilience on the landscape.

²⁰ Includes treatments in salvage areas, which dominated the collaboratives work between 2001-2005.

Members of the collaborative believe that development of the long-range strategy, and the presence and success of their group has contributed to further investment in the landscape. For example, the collaborative group has ensured the ability to get work done in the forest and increased the agencies and industries abilities to invest in long-term contracts and forest restoration infrastructure. In 2007, the Collins Company invested in a \$6.8 million dollar small-log sawmill and in the following year the Forest Service developed a 10-year stewardship contract, the first in the Pacific Northwest (LSG 2011). The strategy was also critical in helping the group secure a multi-million dollar Collaborative Forested Landscape Restoration (CFLR) grant in early 2012, which provides funding to implement ecological restoration treatments. Members of the collaborative elaborated on these achievements.

The collaborative helped get things off unproductive dead center where they were in 1998, and has contributed to the viability of the mill and decisions about Collins to stay invested... I think a lot of that is a function of the collaborative (Respondent 15).

[CFLRP] is a great boon to the collaborative because...it's going to allow the collaborative to achieve many more restoration and community benefit goals...Now there is a good reliable funding for the restoration activities (Respondent 9).

However, the collaborative successes, and achievements of the group, were threatened in August of the 2012 when a catastrophic wildfire ignited on the forest.

5.3 A Large Exogenous Shock: The Case of the Barry Point Fire

Extensive timber harvest and fire suppression on the Stewardship Unit resulted in an accumulation of understory vegetation and dense stands, which set the stage for catastrophic wildfire (USFS and BLM 2010). Members of the collaborative are keenly aware of the changed conditions on the landscape. “Without fire being in these forests for about 100 years...[w]e have forests that are overstocked [and] a different species composition than you would have seen historically” (Respondent 3). According to the Lakeview Stewardship Group’s long-range strategy (2011), 31% of the Fremont-Winema National Forest is at high risk of high-severity fire and 47% is at moderate risk of high-severity fire. High-risk stands are predominately white fir, while low risk stands are dominated by ponderosa pine. This is due, in large part, to the expansion of white fir that is a direct result of fire exclusion (LSG 2011). Uncharacteristic high severity wildfire pose a heightened ecological risk due to the presence of invasive species such as Cheatgrass, Medusahead, and three species of thistle (LSG 2011).

On August 5, 2012 a lightning strike ignited the Barry Point Fire on the Fremont-Winema National Forest (USFS 2012d). Wildfires on average are about three day events in this area, however in the case of Barry Point, extreme weather conditions and high fuels loads led to a three-week battle to extinguish the flames (Respondent 3). The fire was not typical in terms of fire behavior, exhibiting large runs at both day

and night. Table 2, below, describes the growth and eventual suppression of the Barry Point Fire.

Table 2: Barry Point Fire Timeline

<i>August 5th</i>	Lighting strike ignites the Barry Point Fire on Fremont-Winema National Forest.
<i>August 7th</i>	Local Type 3 Team takes command. Fire spreads onto adjacent private lands from Fremont-Winema National Forest.
<i>August 9th</i>	Type 2 Team takes control of fire suppression efforts.
<i>August 10th</i>	The fire grows to more than 12,000 acres of public and private forestland.
<i>August 11th</i>	The Barry Point doubles in size in a 24-hour period, growing to more than 24,000 acres.
<i>August 12th</i>	Full Type 1 Team takes over management of fire suppression activities.
<i>August 14th</i>	The fire spreads across more than 48,000 acres.
<i>August 17th</i>	Fire perimeter includes more than 78,000 acres.
<i>August 27th</i>	Fire is considered 100% contained with nearly 93,000 acres burned.

5.3.1 Impact on Private Landowners, Restoration Projects, and Planning Areas

The Barry Point Fire burned nearly 93,000 acres on the Fremont-Winema National Forest in Oregon, Modoc National Forest in California, Collins Company’s private timberlands, and other private lands (USFS 2012d). The fire severity, or the level of tree mortality, within the Barry Point Fire was high, with over 75% mortality within 42% of the fire perimeter (USFS 2012c). An additional 39% of the area was mixed fire severity with 25-75% tree mortality. High and moderate fire severity in this case was described by the U.S. Forest Service as consumption of the litter layer and down woody material and the damage or death of the majority of standing timber.

Within the Lakeview Federal Stewardship Unit, the Barry Point Fire burned up an estimated four years of restoration projects, representing a significant investment of time, energy, and agreement that had been developed through the work of the Lakeview Stewardship Group. The fire impacted current and future elements of the group’s CFLRP project area including the West Drews and Hay Stewardship, East Drews, Wild Dry Rock, and other associated restoration treatments (USFS 2012c). The West Drews planning area, which encompasses the Hay Stewardship project, included 15,000 acres of thinning treatments, 26,000 acres of prescribed burns, and over 90 miles of road decommissioning under a single environmental assessment and without any administrative appeals (LSG 2011). The West Drews project would have provided an estimated 8.3 million board feet of green timber for the local mill through 2016, and the Hay Stewardship project, which was entirely lost in the fire, was ready to offer for bids (USFS 2012c). The East Drews project, which was also lost in the fire, was currently in the planning phase, and the 28,000-acre Environmental Assessment for the project was scheduled for completion by early 2013. One of the future planning areas, Wild Dry Rock, burned in the fire and was expected to provide about 12 million board feet of green timber to the local mill. In short, the Barry Point

Fire burned up all of the “shelf stock” that the Lakeview Stewardship Group had in the “pipeline,” which had tremendous short-term impact on current projects and will certainly influence future restoration treatments on the Stewardship Unit (Respondent 3).

We had worked for years towards getting all the projects lined up and ready to go...We had thinning contracts, we had under burns, and a lot of good successful work. We had four years of projects lined up that would have fed the community when Barry Point fire burned. So it was significant, it was not just catastrophic fire, it was catastrophic to the community (Respondent 4).

It took a big chunk of us...the explosive nature of the fire itself and the fact that when things are going to burn, they're going to burn... It's indiscriminate, it doesn't recognize geo-political boundaries. If the conditions are right, your timber stands will be damaged (Respondent 11).

More than 50 private landowners lost timber or grazing resources, including livestock, hundreds of miles of fencing, and active timber sales (USFS 2012d). Most notably, the Collins Company, the largest private landowner in the area and owner of the local Fremont Sawmill in Lakeview, suffered the loss of more than 20,000 acres of private timberland to the fire. A number of respondents noted that the loss of private property made the Barry Point Fire unique relative to previous wildfires and strained relations between the community and local Forest Service personnel.

[T]ensions run high during a fire and that kind of tears at the fabric of the community (Respondent 5).

[S]ocially [and] economically it was devastating...Ranchers lost their grazing [and] that infrastructure (Respondent 3).

The unusual part about it is that it burned a lot of private land... so that was a major complicating factor (Respondent 9).

Fire severity during Barry Point was consistent across private and public lands, in large part, because fuel conditions were the same across the landscape. According to a member of the Lakeview Stewardship Group, the private lands were “just as choked as the Forest Service” (Respondent 8). Thinning and restoration work is an economic decision, whether the overstocked stands are on public or private land, and for Collins Companies, thinning has not been a viable management option in the past. Following the fire, the company was forced to harvest damaged and dead stands prematurely, which allows Collins to capture some of the value of the timber, but not the market value prior to fire. Additionally, replanting and reforestation costs are estimated to be as high as \$6 million on the private lands burned in Barry Point. Overall, this experience has led Collins to reexamine management strategies in order to reduce the risk of future loss on their lands.

We tend to look at things right in front of our face saying, gosh x dollars per acre to get this done, we just are not going to be able to do it, well look ahead of you or look behind you... its going to cost even more if this burns up. I don't think any of the stands affected by the fire were treated... (Respondent 8).

The dramatic losses of both restoration projects and private property had a devastating emotional impact on members of the collaborative. All of the members of the Lakeview Stewardship Group expressed negative emotional effects, which is rooted in the “vested interest” that the collaborative has in the landscape and the community. A number of members described dealing with the aftermath of the Barry Point as a “grieving process.” The fire called to question the group’s ability to meet restoration goals and get ahead of the high fuel conditions across the Stewardship Unit. “I thought I might be able to see a change in my lifetime. Barry Point made it clear that you are not going to be able to see a change... we’ve got to do more otherwise we are just going to burn it up faster than we can treat it” (Respondent 6). Remarks from other members of the collaborative illustrate the tremendous feeling of loss following Barry Point.

I basically spent twenty years working on the collaborative... The fact that the fire had such a negative impact on folks in the community... honestly, I felt like it had almost trashed twenty years of my work... That was pretty devastating to see... That hurt (Respondent 11).

I was on the front seat of the collaborative from the beginning and I felt like it had failed (Respondent 4).

The Barry Point Fire was so big and so huge... it's just such a catastrophic event, it would be like losing your kid or something like that, it's pretty dramatic (Respondent 8).

I told the Forest Service, Barry Point fire is the wrong name. It's the Devil's fire...it was quite dramatic for me... it was the only time I've been depressed in my life following Barry Point (Respondent 6).

This is what we've been working on and its been taken away from us for no fault of our own. Now what do we do to deal with the devastation... (Respondent 3).

5.4 The Lakeview Stewardship Group’s Response to the Barry Point Fire

Despite the tremendous loss, the Lakeview Stewardship Group emerged from the Barry Point Fire with a collective decision about post fire salvage, timely revisions to the CFLRP, and a unified message about the importance of the “Green Program.” According to members of the collaborative, the group “didn’t lose a step” and is “back on track” working to enhance ecological resilience in the forest and improving socio-economic conditions in the community (Respondent 3). Further, the Barry Point

Fire did not to have “any major impacts” on the “collaborative dynamics and working relationships” that the group relies on to build consensus and provide recommendations to the Forest Service (Respondent 9).

The loss didn't reduce or take away from the group's ability to function or to focus on what needs to be done. It did bring us to a situation where we made a greater commitment to the purpose and the other individuals to make sure the process went forward...Our group is still pushing to move projects along, we're still communicating, we're still sharing information... We've learned how supportive this group is, how strongly committed they are to what we're doing... That's kind of the nature of who we are and what we do (Respondent 3).

5.4.1 Post-fire Salvage

Immediately following the Barry Point Fire, salvage logging was the “major challenge” the collaborative needed to address (Respondent 9). Salvage logging is a controversial topic across the American West. Research has argued that there are no ecological benefits to salvage logging because dead, standing trees are “biological legacies” that provide habitat for wildlife, and salvage operations often have deleterious effects on soils and riparian areas (USFS 2013). Salvage timber sales, however, are justified in cases where there are compelling socio-economic reasons for logging such as jobs for local contractors or mills that rely on forest products from public lands, or the reduction of safety risks associated with hazard trees in recreation areas. Due to the competing interests, the challenge for land managers following a fire is to determine “where and when salvage logging is appropriate, and how to avoid, minimize or mitigate the potential for undesirable ecological effects associated with proposed salvage activities” (USFS 2013, p.23).

Management needs arose in the post-Barry Point Fire environment to address public safety, especially along roads and heavily used recreation areas (USFS 2013). The Barry Point Salvage Project was developed to address these issues and was first described in Fremont-Winema National Forest's quarterly Schedule of Proposed Actions (SOPA) in October of 2012²¹. The proposed Barry Point Salvage Project worked to reforest burned areas, address road-related issues, and support the local mill and timber dependent employment. The proposed salvage area included 43,134 acres on the Fremont-Winema National Forest, all of which was within the boundaries of the Lakeview Federal Stewardship Unit²². A Proposed Action scoping packet was released on November 9, 2012 and sent to interested parties and

²¹ Decision framework employed by the Forest Service includes three main questions (USFS 2013):

- 1) “Should the Proposed Action, an alternative action, or a modified version of the Proposed Action or an alternative action be implemented, or should no action be taken at this time in the Barry Point Fire Salvage Project area?”
- 2) “Would the selected action have a significant impact upon the quality of the human environment and thus require development of an environmental impact statement (EIS)?”
- 3) “What, if any, site-specific Forest Plan amendments are necessary?”

²² The Environmental Assessment is applicable only to the Fremont-Winema National Forest in Oregon (USFS 2013).

stakeholders, marking the beginning of the 30-day public comment period. In response to the Proposed Action scoping packet, “[p]ublic comments ranged from full support for the Proposed Action, including suggestions to expand the area being considered for salvage, to complete opposition to any form of salvage harvest” (USFS 2013, p. 11). Interviews with members of the Lakeview Stewardship Group reflect these stark differences in opinion towards salvage logging.

There is no ecological reason to do post-fire salvage...Salvage is what we do with totaled cars or sunken ships, it comes from the premise that basically saying a burned forest is a destroyed forest and has no value other than the immediate timber value (Respondent 15).

[O]ne thing I am pretty firm on is that we needed to do a salvage project (Respondent 6).

Members of the collaborative maintain disparate views regarding salvage logging. Yet, the collaborative came together following the fire to articulate a mutually agreed upon set of conditions, or “sideboards,” for any proposed salvage harvest (Respondent 15). Common features of all proposed and alternative salvage harvest projects include no salvage on slopes greater than 35 degrees, no salvage in old growth or riparian habitat management areas, no temporary road construction, slash piling and burning at landings, reforestation based on historical stand conditions and in accordance with the National Forest Management Act (NFMA), and the retention of snags to ensure a diverse range of habitat conditions (USFS 2013). According to members of the collaborative, the process never became “disruptive or dysfunctional” because of the “quality of the people involved” and their agreement about the need to “talk through and come to an agreement about salvage” (Respondent 15).

The Lakeview Stewardship Group was also effective at assuaging litigious parties who oppose salvage logging. The members of the collaborative, primarily those who represent environmental groups, played a critical role in keeping lines of communication open between the collaborative and outside environmental interest. At times, the risk of litigation hung over the Barry Point Salvage Project. According to members of the Lakeview Stewardship Group, there were “a number of outside environmental groups” that were “very opposed to post-fire salvage” and that “submitted comments and varying appeals.” The environmental groups who are formal members of the collaborative were effective at ultimately working to ensure that litigation wouldn’t hold up the process.

Although the collaborative was successful at coming together to provide a recommendation to the Forest Service regarding salvage and, at the same time, successfully kept outside environmental groups at bay, the Barry Point Fire Salvage Project did not “pencil out” for the local mill and subsequently received no bids. The economic viability of the salvage sale may have been dictated by limitations in the planning area as well other natural processes that degrade the value of burned timber. According to the Environmental Assessment for the Barry Point Salvage Project,

limitations associated with topography, stream buffers, and mortality rates reduced the area suitable for harvest to 19% of the total planning area (USFS 2013). Blue stain, which reduces the grade of the wood, is common in burned ponderosa pine, and two years following the Barry Point Fire, nearly 100% of dead ponderosa pine will be affected by blue stain (USFS 2013). Insect infestation, decay, and cracking also reduced the value of the potentially salvageable wood (USFS 2013).

Although the salvage sale ultimately didn't work out, the group believes that the experience working through the Barry Point Salvage Project has reinforced the importance of solid communication. Members of the collaborative believe that they "did about as well as they could" and shared positive remarks about their ability to remain unified in the face of a highly controversial issue. One member of the collaborative shared that, "[t]he Forest Service was able to finish their environmental analysis and make a decision in less than a year, which isn't great, but reasonably prompt given the size and complexity of it. The collaborative stuck together and we were all pretty much on the same page with our recommendation, so that was good" (Respondent 9). Further, members of the collaborative noted that the process of discussing mutually agreed upon "sideboards" following Barry Point provides the collaborative with a starting place the next time wildfire strikes.

[W]hen it came down to salvage it didn't work... materials deteriorated... I recognize looking backwards that Collins [Company] and the agency probably needed to do a little better job communicating (Respondent 11).

To the extent that...the Barry Point Fire and the ultimate failure of the project coming out of it...that helps us to prepare better for the next fire... [and] can help us respond more quickly (Respondent 15).

Early on in the post-fire salvage discussions, the collaborative recognized that salvage was something that "needed to be dealt with on a short term basis," but was a "sideshow" to the main focus of their work, which is the "Green Program." (Respondent 9).

5.4.2 CFLRP Revisions and the Importance of the "Green Program"

The Lakeview Stewardship Group's "Green Program" is the application of fuels reduction treatments on the Stewardship Unit. This has been the primary focus of groups work since 2006 and is critical in helping the collaborative "accomplish restoration goals" (Respondent 7). However, the losses to "Green Program" planning areas in the Barry Point Fire resulted in changed conditions that necessitate amendments to the CFLRP proposal.

Theoretically, [CFLRP] was going to provide some money to do things that we've been wanting to do for a long time, then the Barry Point fire happened that shifted resources and shifted the focus...what happened out in the forest really changed where we were going with the CFLR (Respondent 5).

According to U.S. Forest Service documentation, “[c]ancellation of the East Drews planning process and loss to fire of some Hay Stewardship units within the fire perimeter represent a substantial loss of both anticipated watershed restoration activities and green timber harvest in the [Lakeview Federal Stewardship Unit]” (USFS 2013, p.3). Shortly after Barry Point, the Fremont-Winema National Forest and Lakeview Stewardship Group submitted a proposed CFLRP revision to the U.S. Forest Service Washington office. The revision does not propose changes to the foundational principles of the restoration strategy, rather it specifically addresses the funding calendar and funding for FY2013, project scheduling and outputs, and use of CFLR funds for reforestation (LSG 2012).

Immediately following the fire, the collaborative began working with the Forest Service to identify new planning areas for restoration treatments, namely in the North Warner Mountains, and initiating conversations with the agency to start the NEPA process. The planning process can take years and the group understood that they “had to get on it right away” and effectively communicate that message to the Forest Service (Respondent 6). “[W]e still had to make sure that our message...to continue to advance the green program [was] communicate[d] back to the Forest [Service]...we had to accelerate the planning, and coordination, and communication to bring in the projects that we would be looking to start to implement as soon as possible” (Respondent 3). The collaborative group’s ability to quickly adapt to the changed conditions and communicate a unified message to the agency has helped to ensure that future restoration projects are being developed on the Stewardship Unit.

5.5 Sources of Resilience

The capacity of the Lakeview Stewardship Group to respond and adapt to the changed conditions on the ground through the development of consensus around post-fire salvage, and their continued commitment to one another, the process, and the restoration treatments at the core of their work, illustrates the resilience of the group to the Barry Point Fire. But, what explains this demonstrated resilience? The answer leads us to the critical role of social capital and trust within the collaborative; a consensus-based decision-making process; the successful integration of, and partnership with, the agency, USFS, with primary responsibilities for forest management; the group’s experience with previous exogenous shocks; and a commitment to an active adaptive management approach.

5.5.1 Social Capital: Strong Relationships and Trust within the Collaborative

Trust is critical in facilitating action in natural resource governance (Bodin et al. 2006). The core members of the Lakeview Stewardship Group have worked together since 1998 and over more than a decade and a half, have been successful at building strong relationships and trust through a commitment to the process. As one member of the collaborative shared, “the group has grown from the inception with a common set of values and trust in one another...your committed to not just the land but the other people that you are working with” (Respondent 3). Other comments from the collaborative group reflect the same sentiment.

It's a pretty amazing group. It's a fun group. And we don't agree on everything. My goodness we have knock down drag outs, but... even though we have major disagreements over certain things...we can...come to a conclusion that we feel good about (Respondent 2).

It's not just an eight to five job. You've invested more in this process...in the land...in the people, its invested in what we see in the future...We are all really good friends and that's what it comes down to (Respondent 3).

We discuss the issue... agree to disagree and our friendships are still good. We don't have to agree on everything. It would be a boring world if everybody agreed on everything (Respondent 6).

Every member of the collaborative shared that the strong relationships among core members of the group helped the collaborative respond to the aftermath of the Barry Point Fire. Those relationships helped the group come to consensus around salvage and effectively work to keep the “Green Program” moving. The core members of the group refer to each other as friends and understand that those relationships have taken “time, credibility, honesty, and trust” to build (Respondent 8). “That trust is high,” in large part, because every core group member has “been there since the inception” and continues to be involved. That has helped foster an “effective, robust collaborative that is going to be listened to” and respected (Respondent 6). At times, the group has also purposefully avoided highly contentious issues, such as Forest Stewardship Council certification, in order to ensure that collaborative conversations continued. Since the beginning, this has contributed to the development of strong relationships and trust.

The core group includes members of industry, community-based groups, and environmental interests, who collectively represent a diverse group of important sources of novel information and outside influence. The adversarial setting that characterized the beginning of collaboration in Lakeview represents weak bridging ties, for example, between an environmental representative and a member of the local timber industry, which over time has been converted into strong bonding ties through the development of relationships rooted in trust and friendship. This speaks to the overall level of social capital that the group relies upon to understand one another's perspectives, ensure that the process remains true to landscape and community objectives, and which has resulted in the development of relationships that can be relied upon in times of distress, such as the Barry Point Fire. One of the collaborative participants summarized this point, sharing that “given... who the people involved are and the history we have working with one another and the trust that goes with that. We're generally able to... move fairly quickly” (Respondent 15).

5.5.2 Collaborative, Consensus-Based Decision Making

Collaborative planning can improve relationships and trust and enhance the ability to deal with change, which is essential for adaptation in social-ecological systems (Goldstein 2012, Zellner et al. 2012, Folke 2006, p.261). Zellner et al. (2012) expands

on this, arguing that “[p]urposeful, collaborative planning can help prepare for crisis because diverse stakeholders learn to recognize shared vulnerability and entrust each other to compose innovative responses together, using their differences in knowledge and experience as a resource” (p.44). The collaborative governance process in Lakeview is responsive to change, in part, because the group has accumulated institutional knowledge about the landscape, respects and understands one another’s perspectives, and is supported by established formal and informal policies and norms.

The Lakeview Stewardship Group’s consensus based decision-making process is adaptive in the face of an exogenous shock because the group has developed a high level of familiarity with the issues on the landscape and well-established lines of communication. The group makes it a point to regularly “walk the ground” and uses site visits as opportunities to “ground truth” proposed restoration treatments (Respondent 11). This type of collaborative learning results in an intimate and mutual understanding of the issues across the landscape and contributes to their ability to build consensus. Further, members of the collaborative use email and phone calls prolifically, checking in with one another, sharing information, and responding to proposed actions in a timely, deliberate, and respectful manner.

According to members of the collaborative, “people bring their ability to listen sincerely, speak honestly...[and] to identify the common interests,” and if there is a meeting that one of the members is not able to attend, the group actively works to ensure that voice is heard, even in their absence. In other words, members of the collaborative will purposefully bring up missing individuals perspectives to ensure a decision is made that respects differences in opinion and encourages continued faith in the process. As one of the core members of the collaborative has famously described, the members “get naked in the sandbox together,” letting their values and opinions be known. That transparency helps to ensure that there is no “game playing” and that the collaborative, consensus-based process maintains “integrity and credibility,” even when a member is not able to attend a meeting (Respondent 15).

The decision-making process is not only enhanced by the group’s familiarity with the landscape and one another, but is also bolstered through established policies that provide specific guidance around contentious issues²³. A common, often contentious, issue in collaborative forest management is the definition of old growth. In 1994, the Forest Service adopted a rule to stop the harvesting of trees greater than 21 inches on dry forests east of the Cascade Mountains (Ager et al. 2010, Phillips 2010). This rule has come to be affectionately known as the “21-inch rule” and is often a point of disagreement in collaborative groups. Although some members of the collaborative consider the 21-inch rule²⁴ an “inappropriate one size fits all blanket.” In most cases,

²³ Government plays a crucial role in establishing standards and in some cases taking a top-down approach to environmental management, where market or grassroots solutions are not a viable option (Weber 2000).

²⁴ Scholz and Wang (2006) argue that federal regulations, such as the 21-inch rule, provide sideboards, or limits, upon which the policy network can then attempt to make decisions within. These regulations act as boundaries and expectations that shape the conversation and encourage all interested parties to

the 21-inch rule has not hindered progress, but actually helped facilitate action by having established guidelines in which the collaborative decision-making process occurs within. The 21-inch rule “helped in the early days because it was off the table. It was something we didn’t have to argue about” (Respondent 15). Then, after “trust was built up” the Lakeview Stewardship Group worked together to attain categorical exclusions to harvest some trees greater than 21-inches, primarily white fir, in areas where they would have not historically existed (LSG 2011).

5.5.3 Partnership with the Forest Service

The Forest Service not only provides some guidelines for the decision-making process, but also plays a critical role in the ultimate success or failure of the collaborative in meeting land management goals (Butler 2013) and adapting to changed conditions, such as the aftermath of Barry Point. Adaptation and resilience in this context is supported, in part, by an adaptive co-management strategy that relies on involvement from multiple levels of government (Walker et al. 2006b). Co-management of forest resources, in this case of the Stewardship Unit, engages county commissioners, state-level agencies, and federal land managers. Although each of these respective government partners plays an important role in the collaborative process, the partnership with the Forest Service is a necessary to social-ecological resilience because the agency serves as the ultimate decision maker on the landscape, in charge of coordinating and implementing forest management strategies.

Adaptation implies action and without the Forest Service the collaborative would just be “people telling each other what they think” (Respondent 4). The Lakeview Stewardship Group’s strong partnership with the Forest Service helps to ensure the continued progress of the collaborative and their ecological and socio-economic goals, especially in times of change, when responsiveness, communication, and trust are vital. The Forest Service is a valuable source of maps, reports, and up-to-date stand-level information that is critical in the decision-making process, especially following a large wildfire like Barry Point, which changes conditions on the ground dramatically.

The Lakeview Stewardship Group’s strong partnership with the Forest Service is due, in part, to the recognized interdependencies and shared goals between the collaborative and agency. The Forest Service relies on the collaborative to provide feedback regarding proposed management strategies, build community buy-in and support for projects, and reduce the risk of litigation. This has led the Forest Service, at multiple levels of the agency, to actively work with and support the Lakeview Stewardship Group²⁵. An example that exemplifies the agencies commitment to the

not only comply, but also make efforts to enhance the capacity of the overall resource. This is due, in part, to the social cost of pushing the limits of the established rule.

²⁵ Interviews with the members of the Lakeview Stewardship Group indicate that their relationship with the Forest Service would most likely fall into the “involvement” category put forth by Butler (2013). Members of the collaborative shared that the Forest Service maintains “very strong and regular involvement” in an “advisory role,” regularly attending meetings and field trips and engaging in dialogue. The Forest Service is considered a strong, important partner in meeting land management goals, but does not participate in the formal decision-making process.

collaborative is the recruitment of leadership that supports and engages in the work of the collaborative. As one members of the collaborative shared, “[O]ne of the reasons we were really successful from the start is that our Forest Supervisor was open to working this way, which was really not the way the Forest Service used to do business. If [the Forest Supervisor] hadn’t been thinking let’s try this, we would be just a bunch of people sitting around a table going well here’s what we think. So I really want to give a lot of credit to the Forest Service” (Respondent 5). According to members of the agency and the collaborative, the Forest Service “is sensitive and aware of what needs to happen to support collaboration” and has recruited both Forest Supervisors and District Rangers that have experience working successfully with collaborative groups (Respondent 3). Members of the Forest Service that are involved in collaborative efforts also shared that the agency works to “respect what has been done in the past” and “help the collaborative continue to be a partner.”

5.5.4 Experience with Previous Exogenous Shocks

In 2006, the Lakeview Stewardship Group made a strong and concerted effort to permanently transition away from “chasing salvage” towards actively pursuing restoration treatments in green, live stands (Respondent 9). The Barry Point Fire challenged that decision, forcing the group to discuss salvage and re-hash conversations about mutually agreed upon standards, while at the same time trying to assuage threats of litigation from outside environmental groups. Previous fires, namely the Toolbox Complex that burned in 2002, prepared the collaborative to have a conversation about salvage and come to agreement about how to move forward following the fire. The Toolbox Complex was composed of three individual fires: the Winter Fire, Grizzly Fire, and Toolbox Fire, that burned across the landscape and on parts of the Stewardship Unit (LSG 2011). Much of the fire burned at high severity, resulting in stand replacing conditions, and forcing the collaborative to discuss salvage. Members of the collaborative shared how this experience prepared them to deal with Barry Point.

The [Toolbox] fire was the first fire after the collaborative formed and so that was kind of our test run and that was probably where we learned what things we could work together on... we were able to come to an agreement on salvage... we learned that we could be successful in doing something that’s a little controversial and be effective (Respondent 5).

[T]he collaborative had worked on salvage sales in the past, had found agreement, and had worked to solve challenges [or appeals] from other groups (Respondent 15).

Other exogenous shocks have also impacted the work of the Lakeview Stewardship Group. In 2005, a Coordinated Offering Protocol (CROP) was completed and found that within a 100-mile radius of Lakeview, there was enough volume to support a small diameter mill and a biomass energy plant (LSG 2011). In 2009, Iberdrola, an energy company based in Spain, purchased the development rights for the Lakeview

Biomass Project from Marubeni Sustainable Energy, who had sited plans for a 15-megawatt plant. In 2010, Iberdrola began construction on a 26-megawatt biomass power plant. According to the Lakeview Stewardship Group's long-range strategy, "the biomass plant was the last major piece of industrial infrastructure needed to effectively utilize the large amount of small-diameter trees and woody biomass that will be generated as by-products of restoration treatments in the [Stewardship] Unit" (LSG 2011, p. 6). Unfortunately, Iberdrola was not able to secure a long-term contract for the power that was going to be generated at the facility and ceased construction efforts in 2012. A large cement pad, adjacent to the Collins Companies Fremont Sawmill, is the only sign of the power plant that remains today.

Disappointment also struck in 2010 when the collaborative found out that they had not been awarded a competitive grant to fund restoration work. In 2010, the Collaborative Forest Landscape Restoration Program (CFLRP) offered the first round of competitive applications. The Lakeview Stewardship Group applied, but was "shocked" to find out that they did not receive a CFLRP grant (Respondent 7). The group remained defiant and continued to seek external funding sources for restoration work. In the second CFLRP application cycle in 2011, the collaborative applied again and was awarded a \$3.5 million grant, the largest award that has been given to a collaborative group to date.

5.5.5 Employing an Active Adaptive Management Approach

Adaptive management approaches include monitoring strategies (Schultz and Coelho 2012), the incorporation of new knowledge into local resource use decisions (Hahn et al. 2006, Dietz et al. 2003), and an understanding that unexpected events and change are likely to occur (Bojórquez-Tapia and Eakin 2012, Bodin and Prell 2011, Hahn et al. 2006). Adaptive management strategies prepare resource users to respond to an exogenous shock and thus enhance the resilience of a given system (Hahn et al. 2006, Folke et al. 2005). The Lakeview Stewardship Group employs an active adaptive management strategy that includes a well-established monitoring program that works to integrate new information into the collaborative decision-making process. Further, the group has fostered an internal culture that accepts uncertainty- understanding that the data only holds part of the answer – and anticipates that future change on the landscape will occur.

In May of 2002, the Lakeview Stewardship Group, in partnership with the Fremont-Winema Resource Advisory Committee (RAC) and the Lake County Resource Initiative (LCRI), developed the Chewaucan Biophysical Monitoring Project²⁶. The monitoring project collects information about the composition, structure, and function of the ecosystem from hundreds of permanent plots across the Stewardship Unit (LSG 2011, p.58). Monitoring is seen by collaborative participants as a critical component

²⁶ High school and college students are recruited each year from the local community to collect monitoring data. Natural resource professionals train the students and provide them with an unparalleled experience developing applied skills in natural resource management. According to a number of respondents, this local connection contributes to the larger community support for the monitoring program.

of adaptive and effective management strategies for the landscape, and the data from the plots within the Stewardship Unit are used to assess the effectiveness of management strategies and to make informed decisions about future treatments. Members of the collaborative describe the monitoring program as the “feedback loop” that “influences decisions” by helping the collaborative understand how effective certain management strategies have been in meeting goals (Respondent 2).

An example of how monitoring has influenced the decision making process includes the compaction of soil, which was a perceived issue and area of disagreement among collaborative members. In this case, “monitoring essentially showed that with current [logging] technology and practices that we just were not further compacting the soil.” A technique called “v-ripping” or deep ripping, which had been previously used, was no longer accepted practice because, in large part, soil compaction was found to not be an issue according to data from the Chewaucan Monitoring Project (Respondent 2). According to another member of the collaborative, in this case, “monitoring was the proof” (Respondent 5).

The collaborative monitoring program has recently been bolstered by the Lakeview Stewardship Group’s successful application to the Collaborative Forest Landscape Restoration Program (CFLRP). CFLRP²⁷ has provided resources to expand the monitoring program and opened up opportunities to connect with other collaborative groups in the region to gather and share ideas. Schultz and Coelho (2012) studied monitoring strategies employed by CFLRP-funded groups and found that monitoring works to resolve uncertainties, build trust and credibility among members of the collaborative, increase the accountability of resource managers, enhance social learning, effectively measure treatments against stated goals, and support adaptive management strategies. In the case of the Lakeview Stewardship Group, the monitoring strategy is clearly helping to measure the effectiveness of ecological restoration treatments and provides a critical component of the larger adaptive management strategy.

Although the collaborative relies on the monitoring program to provide information about different management strategies, the group understands that the monitoring data alone does not hold all of the answers and that there are inherent uncertainties in working in complex social-ecological systems. This perspective, shared across the interviewees, has fostered an internal culture that accepts uncertainty and anticipates that future change will occur. The example that was consistently drawn upon by collaborative participants was that of the risk of future wildfire, in part, due to the impending threats associated with climate change.

Increasing levels of greenhouse gasses in the atmosphere are likely to result in hotter and drier conditions, influencing the duration of the fire season, plant growth, droughts and blight, insect invasions, and the prominence of invasive species (TNC

²⁷ CFLRP legislation requires collaborative groups to monitor not only ecological conditions, but also social and economic outcomes, which makes the competitive grant program unique among land management legislation (Schultz and Coelho 2012).

2013). In the western United States, climate change is likely to increase the frequency and size of fires due to increased temperatures, early spring snow melt, and a longer fire season. The Lakeview Stewardship Group recognizes that climate change is a threat to achieving their tripartite goals, and the collaborative is actively working to restore historical, resilient conditions on the landscape in order to prepare for future, unpredictable catastrophic wildfire (LSG 2011).

Members of the collaborative expect large fires to occur again, although they hope that the size and intensity of fires will decrease as the pace and scale of restoration work increases. Collaborative participants shared that fire is part of “everyday life” on the eastside of the Cascades, and so it is “nearly impossible” not to be prepared for it (Respondent 8). Further, the group has “come together and decided we need to... get the work done to prevent it from happening again” (Respondent 4). Another member of the group shared similar sentiments, but took the thought one step further by arguing that anticipating future wildfire events should incite action.

[W]e need to... anticipate that fires are going to happen...and come up with some agreed upon guidelines that can be applied more quickly once a fire occurs...Finding agreement on what to do post-fire may be the most important thing that we can do (Respondent 15).

On many landscapes, it is not a question of if catastrophic wildfire is going to happen, it is a question of when it will happen, and under what circumstances. Anticipating future disturbance events, as the respondent astutely pointed out, implies that collaborative groups should have conversations about post-fire salvage before the fire occurs. This starts by developing an established set of values and principles that can be mutually agreed upon by members of the group. In the case of the Lakeview Stewardship Group, the agreement around salvage developed following the 2002 Toolbox Complex Fires and again in 2012 in the aftermath of Barry Point has positioned the group to quickly respond to the next wildfire.

5.6 Key Challenges and Future Direction

The Lakeview Stewardship Group has demonstrated that they are resilient to a large exogenous shock such as the Barry Point Fire through the strong relationships and trust that exist among members of the group, their solid partnership with the U.S. Forest Service – the ultimate decision-maker and arbiter of the Stewardship Unit, the group’s experience with previous exogenous shocks, and their investment in an active adaptive management approach. However, as Walker et al. (2006b) points out, resilience to an exogenous shock does not necessarily imply future resilience. The chief potential challenges to the Stewardship Group’s resilience include:

- the inevitable turnover among core collaborative participants,
- community apathy,
- USFS rotation and promotion policies, and
- maintaining and increasing the flow of funding.

Addressing these challenges increases the likelihood of continued resilience for the collaborative group in Lakeview, and along with it, their capacity to collectively and successfully work together with the USFS to restore and manage the area's public forests.

5.6.1 Inevitable Turnover Among Core Members

Members of the collaborative shared concern about the impending loss of core participants in the Lakeview Stewardship Group. A number of the core members have either recently retired, moved out of the community, or are near retirement age. The group has struggled to recruit new talent and needs to begin the process of transferring institutional knowledge. Burnout appears to not be an issue; members remain dedicated even after 16 years of collaborating, but turnover is inevitable given the age of the core members. And, because the group is so tight-knit and relatively small there is a sense that it is hard for "outsiders" to break into the group and that each member is critically important to the overall work of the collaborative, respectively.

We've worked together for a long time and we come to agreement pretty quickly. Some people may say that's not entirely a good thing...the downside of that tightness is that each individual is disproportionately important to the overall function of the group (Respondent 15).

That's my biggest worry...the core group is now close to twenty years and...our group is getting smaller. I don't know that it is expanding at the right rate (Respondent 5).

As a result, the Lakeview Stewardship Group will need to make a concerted effort, in the not so distant future, to bring in new members, cultivate leaders, and transition accrued institutional knowledge²⁸. One way that this could occur is through the formalization of the process²⁹. As members retire from the group, there needs to be a thoughtful effort to ensure that the respective stakeholder groups are still represented. In other words, if an environmental representative plans to leave, then he or she needs to recruit and cultivate an appropriate replacement. Or, the group needs to adopt a replacement that can fit in.

All parties need to continue to be represented in the future, and that may require that the group develop a standard number of seats for each respective group: industry, environmental, community, and so on. Formalization in this way ensures that there will be adequate representation. That doesn't mean that those who are not affiliated are not able to participate. The group can maintain its somewhat amorphous state by

²⁸ Institutional knowledge is the collective experiences that facilitate trust building and that can be invoked as a starting place for decision-making in times of change (Bodin et al. 2006).

²⁹ In a case study conducted by Hahn et al. (2006) the organization under study succeeded at connecting formal and informal institutions in the collaboration, but remained somewhat vulnerable due to the informal nature of the collaborative itself.

keeping membership open, while simply requiring that at least two individuals represent each of the critical interests identified by the group. Institutionalizing a structure does not necessarily mean creating a more formal decision-making process. The informal nature of the consensus-based process is an asset of the group and the membership believe in that process.

The policy recommendation that flows from this challenge is straightforward—develop and systematically pursue a “new member recruitment” strategy that specifically ensures replacement of key participants, and their issue or interest areas, in order to maintain representativeness and continuous functioning across time. Consultation with a professional succession planner or strategic planning expert is one way forward here. Another would be to consult with other collaborative community groups throughout the Western U.S. to see how they manage this same issue. A good example of a collaborative governance group that has successfully managed this specific challenge is the Blackfoot Challenge in Montana (see Weber 2012).

5.6.2 Community Apathy

The members of the collaborative sense a level of apathy at the community level that presents a challenge to recruiting new members and keeping the community and collaborative close. The collaborative formed because they were vulnerable and desperate, yet today there is a perception that someone else, namely the collaborative, will take care of the natural resource issues. Even though there is only one mill remaining in Lake County, many in the collaborative feel as though the broader community is not interested in engaging with the group, in part, because they think the collaborative is doing a good job.

The collaborative is trusted among members of the community...we've got this little role in the community right now and I don't think that's changed for a long time...maybe other people aren't stepping up to get involved in forest management because the collaborative is doing their thing and their fine (Respondent 5).

Cheek (1996) in her review of the Lakeview Federal Stewardship Unit argues that the presence of the Unit ensures a reliable level of timber harvest, and therefore the local timber industry does not experience the same boom and bust cycles that impact other communities. The author points out that this creates a smoothing effect, which is more desirable in terms of socio-economic conditions, but may contribute to a false sense of security by isolating the community from some of the change agents that facilitate innovation.

Again, the policy recommendation is common sense—the collaborative needs to devote more time and effort to building and enhancing the relationships between the larger community and the Stewardship Group. Taking stock of lessons learned from other collaborative governance groups around the West can also help here. Many such groups invest in community BBQs, regular public meetings that explain their

work and asking for public input into plans, and a number of other things (see Weber 2003, Weber 2012).

5.6.3 Forest Service Turnover

Herbert Kaufman, in his seminal 1960 book on the administrative behavior of Forest Rangers in the U.S. Forest Service, sheds light on the culture of the agency and the regular turnover among Forest Service staff. In short, agency personnel move to different forests more often than Catholic priests move to new parishes. Historically, this is the result of the agencies concern with the embeddedness of agency staff members in the respective communities in which they work. In other words, the agency has taken a risk averse approach to district level decision making, working to ensure that the process is not co-opted³⁰ by local interests – cattlemen, commissioners, and loggers – who maintain priorities that may be in conflict with larger agency directives (Kaufman 1960).

The Lakeview Stewardship Group's CFLRP proposal lists five Forest Service staff members that were involved in collaborative land management efforts on the Fremont-Winema National Forest in 2011. At the time of this study, in the spring of 2014, four out of those five staff members had moved to a different forest. Many collaborative members considered turnover an issue that has a direct impact on the work of the collaborative, potentially slowing down progress due to the need to bring new staff members up to speed, particularly District Rangers and Forest Supervisors. Others suggested that turnover had little to no effect on the group, in part, because the Forest Service actively works to recruit leaders who are invested in the collaborative process and interested in working closely with the Lakeview Stewardship Group.

You get the turnover, you get the people who are engaged in all of it taking off... It makes it really difficult because you have to get them up to speed...[it] is a cost involved. The Forest Service folks should be staying here longer (Respondent 8).

The learning curve is pretty steep every time you bring someone along (Respondent 4).

If there is a Forest Supervisor that does not want to work with the collaborative that's going to make it incredibly hard and I don't have any war stories to tell about that, but I know people in other collaboratives that have had very successful groups that were just basically skidded to a halt either when there was turnover of a District Ranger or a Forest Supervisor that wasn't appreciative of the concept (Respondent 5).

³⁰ Scholz and Wang (2006) study cooptation in collaborative governance arrangements and find that agency decisions are more likely to reflect local interests, to the detriment of the federal mandate, if the agencies regulatory goals rely on local resources. Cooptation often occurs in cases where field officers and regulatory officials are regularly interacting with and confronting local practitioners, which reduces compliance rates and increases enforcement costs.

If the agency is interested in becoming more invested in the communities they work, they may consider a policy that provides incentives for Forest Service employees to stay on a forest or district for a certain period of time. Interviewees suggested a minimum of three years on a given forest.

5.6.4 Maintaining and Increasing the Flow of Funding

To date, the Lakeview Stewardship Group has enjoyed success in securing the funding necessary to pursue the kinds of forest restoration treatment plans required to maintain and enhance the ecological resilience of the Fremont-Winema Forests. Yet, just as with the larger USFS system, to ensure that the rates of restoration is adequate for restoring resilience to national forestland funding needs to be increased (TNC 2013, Stephens et al. 2013, North et al. 2012, LSG 2011).³¹ The flip side of this coin is getting the USFS to increase the efficiency and scale of NEPA planning, thus making resources go further to cover more restoration projects³². Yet, agency staff, at least according to some, do not currently have the capacity or resources to get projects out the door fast enough³³.

Further, additional resources would prove useful at the county level, particularly given that Lake County currently lacks the local capacity to conduct restoration at the scale necessary to restore ecological resilience and get ahead of the threat of wildfire in the area's forests. Phillips (2010) found that approximately 50% of local labor was used in the period between 2000 and 2009 for logging and road building on the Unit. The author points out that part of the reason that the local labor force does not comprise 100% is because there are no local firms that conduct helicopter logging and that local logging companies were running at full capacity during that period. This limited capacity is purportedly a direct result of reductions in harvest opportunities and subsequently fewer contractors in the area (Phillips 2010). In light

³¹ North et al. (2012) examines current fuel reduction management strategies relative to historic fire conditions in the Sierra Nevadas and find that "current fuels reduction acreage is substantially below historic levels, relegating most areas to accumulating high fuel loads." The author concludes that "the current pattern and scale of fuel reduction is unlikely to ever significantly advance restoration efforts, particularly if agency budgets continue to decline" (p.393). Further, "[i]n 2011 and 2012 restoration accomplishments via burning and mechanical thinning amounted to about 4.65 million acres per year, equating to an annualized restoration rate of about 6 percent of the total need. Of this, mechanical treatments remained a small component— 203,350 acres, meaning that mechanical treatments were implemented with an annualized restoration rate of about 1.6 percent of the total need in recent years" (Kittler 2014).

³² The planning requirements associated with the National Environmental Policy Act (NEPA) are time-consuming, expensive endeavors and without successful planning, thinning and other restoration treatments cannot take place on the ground. Steelman and Burke (2007) argue that federal environmental laws such as NEPA make restoration more expensive, time-intensive, litigious, and administratively burdensome. This has held up projects in many cases and has completely prevented other work from getting done. Categorical exclusions passed under the 2003 Healthy Forest Initiative provide channels for restoration work in high risk ecosystems to be streamlined, yet concerns remain about the amount of work required to go through the process (Stelman and Burke 2007).

³³ The Forest Service has recently piloted the Integrated Resource (IRR) line item in Regions one, three, and four. This is a single budget, big bucket approach that may provide more flexibility in planning and implementation funding.

of issues associated with the loss of local capacity, the Lakeview Stewardship Group, in partnership with the Lake County Resource Initiative, is actively working with local contractors to ensure that the bidding process for federal contracts is accessible.

6. CONCLUSION

In the case of the Lakeview Stewardship Group's response to the Barry Point Fire, this collaborative group of land managers demonstrated resilience due to the strong relationships and trust among members of the group, the partnership with the federal land management agency, an active adaptive management and monitoring strategy, and experience with previous exogenous shocks. However, the Lakeview Stewardship Group still faces challenges at multiple scales, which will ultimately influence the future resilience and continued success of the group. The resilience of the Lakeview Stewardship Group to future disturbance events will depend, in part, on how the group attempts to recruit and integrate new members³⁴, address community apathy, continue to build relationships with the Forest Service, and increase the pace and scale of restoration. Some of these challenges can be addressed directly by the collaborative group, while others, such as breaking the fire suppression "rigidity trap" will ultimately take support from law makers and agency leaders at multiple levels of government.

This research suggests that the federal taxpayer venture in Collaborative Forest Landscape Restoration Program (CFLRP) is a safe investment, at least in the case of Lakeview Stewardship Group. Despite the catastrophic aftermath of the Barry Point Fire, the collaborative remains dedicated to achieving community development and ecological restoration goals. Collaboration is an important tool in meeting the ecological (e.g. ecosystem services) and economic needs of the community, but will that relationship persist? Environmentalists, industry, and land management agencies are currently interdependent; relying on one another to achieve tripartite goals. However, if those dynamics change will collaboration continue to work? Further, there may be limits to this approach and collaborating across landscapes, covering millions of acres, may push some to their political, social, economic, or ecological boundaries. Is there a threshold? How do we know when it has been breached?

Further research in this area should look at other forest collaborative groups that have responded to wildfires to better understand how different contextual variables impact resilience in this setting. Data and findings generated from this type of research could support legislative decision-making regarding the future of the Collaborative Forest Landscape Restoration Program (CFLRP) or other programs aimed at fostering ecological restoration. Further, the research should support collaborative groups work on the ground by addressing key issues of interest and promoting the development of resilient systems. On a larger scale, more research is needed to understand how

³⁴ Bodin and Crona (2009) argue that social networks must be composed of voluntary relational ties in order to be sustained and social networks change and evolve over their lifespan. Collaborative groups change over time as turnover in membership occurs. In times of stability, actors develop new relational ties and strengthen existing ties that can be capitalized on in times of need (Olsson et al. 2006).

communities respond to natural disasters, and specifically, how public policy can contribute to the development of more sustainable and resilient communities in the future. Future research can continue to build on our understanding of social-ecological resilience by working to understand how other forest collaborative groups, watershed partnerships, or communities respond to exogenous shocks – not only natural disasters – but also economic and technological shocks, that force groups of people to come together to act, or conversely, result in devastating consequences.

7. REFERENCES

- Adger, W. N. (2006). Vulnerability. *Global environmental change*, 16(3), 268-281.
- Ager, A. A., Vaillant, N. M., & Finney, M. A. (2010). A comparison of landscape fuel treatment strategies to mitigate wildland fire risk in the urban interface and preserve old forest structure. *Forest Ecology and Management*, 259(8), 1556-1570.
- Ansell, C. (2003). Community embeddedness and collaborative governance in the San Francisco bay area environmental movement. *Social movements and networks: Relational approaches to collective action*, 123-144.
- Binder, C. R., Hinkel, J., Bots, P. W., & Pahl-Wostl, C. (2013). Comparison of Frameworks for Analyzing Social-ecological Systems. *Ecology and Society*, 18(4), 26.
- Bodin, Ö., & Crona, B. I. (2009). The role of social networks in natural resource governance: What relational patterns make a difference?. *Global environmental change*, 19(3), 366-374.
- Bodin, Ö., Crona, B., & Ernstson, H. (2006). Social networks in natural resource management: what is there to learn from a structural perspective?. *Ecology & Society*, 11(2).
- Bodin, Ö., & Prell, C. (Eds.). (2011). *Social networks and natural resource management: uncovering the social fabric of environmental governance*. Cambridge University Press.
- Bojórquez-Tapia, L. A., & Eakin, H. (2012). Conflict and Collaboration in Defining the “Desired State”: The Case of Cozumel, Mexico. *Collaborative Resilience: Moving Through Crisis to Opportunity*, MIT Press, London, 153-176.
- Briske, D. D., Bestelmeyer, B. T., Stringham, T. K., & Shaver, P. L. (2008). Recommendations for development of resilience-based state-and-transition models. *Rangeland Ecology & Management*, 61(4), 359-367.
- Bullock, R., Armitage, D., & Mitchell, B. (2012). Shadow Networks, Social Learning, and Collaborating through Crisis: Building Resilient Forest-Based Communities in Northern Ontario, Canada. *Collaborative Resilience: Moving Through Crisis to Opportunity*, 309.
- Butler, W. H. (2013). Collaboration at Arm's Length: Navigating Agency Engagement in Landscape-Scale Ecological Restoration Collaboratives. *Journal of Forestry*, 111(6), 395-403.

- Butler, W. H., & Goldstein, B. E. (2010). The US fire learning network: springing a rigidity trap through multi-scalar collaborative networks. *Ecology and Society*, 15(3), 21.
- Carlsson, L., & Sandström, A. (2008). Network governance of the commons. *International Journal of the Commons*, 2(1).
- Cheek, K. A. (1996). *Community well-being and Forest Service policy: Re-examining the sustained yield unit* (Doctoral dissertation).
- Chen, Y., & Weber, B. (2012). Federal policy, rural community growth, and wealth creation: The impact of the federal forest policy and rural development spending in the Pacific Northwest. *American Journal of Agricultural Economics*, 94(2), 542-548.
- Cheng, A. S., & Daniels, S. E. (2005). Getting to "we": examining the relationship between geographic scale and ingroup emergence in collaborative watershed planning. *Human ecology review*, 12(1), 30-43.
- Cheng, A. S., Kruger, L. E., & Daniels, S. E. (2003). "Place" as an integrating concept in natural resource politics: Propositions for a social science research agenda. *Society & Natural Resources*, 16(2), 87-104.
- Daniels, S. E., & Walker, G. B. (2001). Working through environmental conflict: The collaborative learning approach.
- Diani, M. (2011). Social movements and collective action. *The sage handbook of social network analysis*, 223-235.
- Dietz, T., Ostrom, E., & Stern, P. C. (2003). The struggle to govern the commons. *science*, 302(5652), 1907-1912.
- Ellison, A., Moseley, C., Evers, C., and Nielsen-Pincus, M. (2012). Forest Service spending on large wildfires in the West. Ecosystem Workforce Program Working Paper No. 41. http://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_41.pdf
- Folke, C. (2006). Resilience: the emergence of a perspective for social–ecological systems analyses. *Global environmental change*, 16(3), 253-267.
- Franklin, J. F., & Johnson, K. N. (2012). A restoration framework for federal forests in the Pacific Northwest. *Journal of Forestry*, 110(8), 429-439.
- Frazier, T. G., Thompson, C. M., Dezzani, R. J., & Butsick, D. (2013). Spatial and temporal quantification of resilience at the community scale. *Applied Geography*, 42, 95-107.

- Goldstein, B. E. (2012). Conclusion: Communicative Resilience. *Collaborative Resilience: Moving Through Crisis to Opportunity*, 359.
- Goldstein, B. E., & Butler, W. H. (2012). Collaborating for Transformative Resilience: Shared Identity in the US Fire Learning Network. *Collaborative Resilience: Moving Through Crisis to Opportunity*, 339.
- Goldstein, B. E., & Butler, W. H. (2010a). Expanding the scope and impact of collaborative planning: combining multi-stakeholder collaboration and communities of practice in a learning network. *Journal of the American Planning Association*, 76(2), 238-249.
- Goldstein, B. E., & Butler, W. H. (2010b). The US Fire Learning Network: Providing a narrative framework for restoring ecosystems, professions, and institutions. *Society and Natural Resources*, 23(10), 935-951.
- Goldstein, B. E., & Butler, W. H. (2010c). The Fire Learning Network: A promising conservation strategy for forestry. *Journal of Forestry*, 108(3), 121-125.
- Granger, C. (1944). The Cooperative Sustained Yield Act. *Journal of Forestry*, 42(8), 558-559.
- Gunderson, L. (1999). Resilience, flexibility and adaptive management—antidotes for spurious certitude. *Conservation ecology*, 3(1), 7.
- Hahn, T., Olsson, P., Folke, C., & Johansson, K. (2006). Trust-building, knowledge generation and organizational innovations: the role of a bridging organization for adaptive comanagement of a wetland landscape around Kristianstad, Sweden. *Human ecology*, 34(4), 573-592.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual review of ecology and systematics*, 1-23.
- Isaac, M. E., Erickson, B. H., Quashie-Sam, S. J., & Timmer, V. R. (2007). Transfer of Knowledge on Agroforestry Management Practices: the Structure of Farmer Advice Networks. *Ecology & Society*, 12(2).
- Janssen, Marco A., Orjan Bodin, John M. Anderies, Thomas Elmqvist, Henrik Ernstson, Ryan RJ McAllister, Per Olsson, and Paul Ryan. (2006). "Toward a network perspective of the study of resilience in social-ecological systems." *Ecology and Society* 11(1), 15.
- Johnston, R., & Pattie, C. (2011). Social networks, geography and neighbourhood effects. *The SAGE Handbook of Social Network Analysis*, 301.

- Kaufman, H. (1960). *The forest ranger: A study in administrative behavior*. Resources for the Future.
- Kaufman, S. (2012). Complex systems, anticipation, and collaborative planning for resilience. *Collaborative Resilience: Moving through Crisis to Opportunity*, 61-98.
- Kittler, Brian. (2014). A Landmark Policy for Restoring Federal Forests: Permanent Authorization of Stewardship Contracting in the Farm Bill. Pinchot Institute for Conservation. <http://www.pinchot.org/doc/495>
- Kobziar, L., Rocca, M., Dicus, C., Hoffman, C., Sugihara, N., Thode, A., Varner, J., and Morgan, P. (2009). Challenges to educating the next generation of wildland fire professionals in the United States. *Journal of Forestry* 107(7), 339-345.
- Knoke, D. (2011). Policy networks. *The SAGE Handbook of Social Network Analysis*, 210-222.
- Lakeview Stewardship Group (LSG). (2011). Long-Range Strategy for the Lakeview Federal Stewardship Unit. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5356799.pdf
- Lakeview Stewardship Group (LSG). (2012). Lakeview Stewardship CFLRP Work Plan. <http://www.fs.fed.us/restoration/documents/cflrp/2012Workplans/LakeviewStewardshipWorkPlan2012.pdf>
- Lee, Y. J. (2014). Social vulnerability indicators as a sustainable planning tool. *Environmental Impact Assessment Review*, 44, 31-42.
- Lubell, M., Schneider, M., Scholz, J. T., & Mete, M. (2002). Watershed partnerships and the emergence of collective action institutions. *American Journal of Political Science*, 148-163.
- Lubell, M. and Segee, B. (2009). Conflict and Cooperation in Natural Resource Management. *Environmental Policy: New Directions for the Twenty-First Century 7th Edition*. Sage.
- National Association of State Foresters (NASF). (2013). NASF Statement on USDA Forest Service Fire Suppression Fund Transfers: Underfunded suppression to get relief by transferring \$600 million from already constrained forestry budgets. <http://www.stateforesters.org/sites/default/files/press-release-documents/NASF%20Statement%20on%20FY13%20Fire%20Transfers%208.26.pdf>
- National Interagency Fire Center. (NIFC). (2013). "Federal Firefighting Costs (Suppression Only)" http://www.nifc.gov/fireInfo/fireInfo_documents/SuppCosts.pdf

- Nelson, R., Kokic, P., Crimp, S., Meinke, H., & Howden, S. M. (2010a). The vulnerability of Australian rural communities to climate variability and change: Part I—Conceptualising and measuring vulnerability. *Environmental Science & Policy*, 13(1), 8-17.
- Nelson, R., Kokic, P., Crimp, S., Martin, P., Meinke, H., Howden, S. M., ... & Nidumolu, U. (2010b). The vulnerability of Australian rural communities to climate variability and change: Part II—Integrating impacts with adaptive capacity. *Environmental Science & Policy*, 13(1), 18-27.
- Newman, L., & Dale, A. (2005). The role of agency in sustainable local community development. *Local environment*, 10(5), 477-486.
- North, M., Collins, B. M., & Stephens, S. (2012). Using fire to increase the scale, benefits, and future maintenance of fuels treatments. *Journal of Forestry*, 110(7), 392-401.
- Olsson, P., Folke, C., & Hughes, T. P. (2008). Navigating the transition to ecosystem-based management of the Great Barrier Reef, Australia. *Proceedings of the National Academy of Sciences*, 105(28), 9489-9494.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge university press.
- Phillips, Richard. (2010). A review of the Lakeview Federal Sustained Yield Unit. Fremont National Forest 2000-2009.
- Portland State University Senior Capstone Course (PSU 2011). “Lakeview, Oregon: The Little Town that Collaboration”
http://www.pdx.edu/npsc/sites/www.pdx.edu.npsc/files/Summer%202011_Capstone%20Course%20Report.pdf
- Putnam, R. D. (2001). *Bowling alone*. Simon and Schuster.
- Reams and Lam (2013). Socioeconomic Responses to Coastal Land Loss and Hurricanes: Measuring Resilience among Outer Continental Shelf-Related Coastal Communities in Louisiana.
<http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5261.pdf>
- Reinhardt, E. D., Keane, R. E., Calkin, D. E., & Cohen, J. D. (2008). Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. *Forest Ecology and Management*, 256(12), 1997-2006.
- Ryan, C. M. (2001). Leadership in collaborative policy-making: An analysis of agency roles in regulatory negotiations. *Policy Sciences*, 34(3-4), 221-245.

Schultz, C. A., Jedd, T., & Beam, R. D. (2012). The Collaborative Forest Landscape Restoration Program: a history and overview of the first projects. *Journal of Forestry*, 110(7), 381-391.

Schultz, C. & Coelho, D. (2012). The Design and Governance of Multi-Party Monitoring Under the Collaborative Forest Landscape Restoration Program. http://coloradoforestrestoration.org/wp-content/uploads/2012/08/2012_CFLRPMonitoringFINAL.pdf

Scholz, J. T., & Wang, C. L. (2006). Cooptation or transformation? Local policy networks and federal regulatory enforcement. *American Journal of Political Science*, 50(1), 81-97.

Schwedler, Jon. (2011). "Was 2011 the Year of Mega-Fire?" <http://blog.nature.org/2011/12/was-2011-the-year-of-mega-fire/?src=e.give&autologin=true>

Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global environmental change*, 16(3), 282-292.

Steelman, T. A., & Burke, C. A. (2007). Is wildfire policy in the United States sustainable?. *Journal of Forestry*, 105(2), 67-72.

Stephens, S. L., Agee, J. K., Fulé, P. Z., North, M. P., Romme, W. H., Swetnam, T. W., & Turner, M. G. (2013). Managing forests and fire in changing climates. *Science*, 342(6154), 41-42.

Sustainable Northwest (SNW) (2013). Region 6 CFLRP Network Collaboratively Advancing Landscape-scale Restoration. Unpublished Report.

The Nature Conservancy (TNC). (2012). "Forest Learning Network Field Guide" <http://www.conservationgateway.org/Files/Pages/fln-field-guide-march-201.aspx>

The Nature Conservancy (TNC). (2013a). "Restoring America's Forests" <http://www.nature.org/ourinitiatives/habitats/forests/restoring-americas-forests.xml>

The Nature Conservancy (TNC). (2013b). "Fire Learning Network Fact Sheet" <http://www.conservationgateway.org/Files/Pages/fln-fact-sheet-feb-2013.aspx>

The Nature Conservancy (TNC) (2013c). "Fire Learning Network: Working together to build resiliency in ecosystems and communities."

Thomas, J. W., Franklin, J. F., Gordon, J., & Johnson, K. N. (2006). The Northwest Forest Plan: origins, components, implementation experience, and suggestions for change. *Conservation Biology*, 20(2), 277-287.

Turner, Christine. (2014). A wildfire forum takes radical approach to protecting wildland-urban interface. High Country News.
<http://www.hcn.org/blogs/goat/behind-closed-doors-wildfire-solutions-forum-takes-radical-approach-to-protecting-wui-from-wildfire>

U.S. Census Bureau. (2010). State and County Quickfacts: Lake County, Oregon.
<http://quickfacts.census.gov/qfd/states/41/41037.html>

United States Forest Service (USFS). (2012a). "People Restoring America's Forests: 2012 Report on the Collaborative Forest Landscape Restoration Program"
<http://www.fs.fed.us/restoration/documents/cflrp/CoalitionReports/CFLRP2012AnnualReport20130108.pdf>

United States Forest Service (USFS) (2012b) "Increasing the Pace and Scale of Restoration and Job Creation on Our National Forests".
<http://www.fs.fed.us/publications/restoration/restoration.pdf>

United States Forest Service (USFS) (2012c) "Proposed Action Statement: Barry Point Salvage Project."
http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/91686_FSPLT2_290469.pdf

United States Forest Service (USFS 2012d) "Barry Point Fire Documentation"
<http://www.fs.usda.gov/detail/fremont-winema/home/?cid=stelprdb5402131>

United States Forest Service (USFS) (2013) "Environmental Assessment Barry Point Salvage Project and Fremont Forest Plan Amendment #37" Fremont Winema National Forest. Lakeview Ranger District. Lakeview, OR.
http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/91686_FSPLT3_1415266.pdf

United States Forest Service and Bureau of Land Management (USFS and BLM 2010) Fremont-Winema and Lakeview District Fire Management Plan.

Walker, B., & Salt, D. (2006). *Resilience thinking: sustaining ecosystems and people in a changing world*. Island Press.

Walker, B. H., Anderies, J. M., Kinzig, A. P., & Ryan, P. (2006a). Exploring resilience in social-ecological systems through comparative studies and theory development: introduction to the special issue. *Ecology and Society*, 11(1), 12.

Walker, B., Gunderson, L., Kinzig, A., Folke, C., Carpenter, S., & Schultz, L. (2006b). A handful of heuristics and some propositions for understanding resilience in social-ecological systems. *Ecology and society*, 11(1), 13.

- Weber, Edward. (2013). "Building Capacity for Collaborative Water Governance in Auckland." Unpublished Report.
- Weber, E. P. (2012a). Unleashing the Potential of Collaborative Governance Arrangements: Getting to Robust Durability in the Blackfoot Valley. *Journal of Sustainable Development*, 5(7), p35.
- Weber, E. P. (2012b). Getting to Resilience in a Climate-Protected Community: Early Problem-Solving Choices, Ideas, and Governance Philosophy. *Collaborative Resilience: Moving Through Crisis to Opportunity*, 177.
- Weber, Edward. (2003). "Bringing Society Back In: Grassroots Ecosystem Management, Accountability, and Sustainable Communities" MIT Press.
- Weber, Edward. (2000). A New Vanguard for the Environment: Grass-Roots Ecosystem Management as a New Environmental Movement." *Society and Natural Resources* 13: 237-259
- Weiss, R. S. (1995). *Learning from strangers: The art and method of qualitative interview studies*. Simon and Schuster.
- Wilson, S., Pearson, L. J., Kashima, Y., Lusher, D., & Pearson, C. (2013). Separating Adaptive Maintenance (Resilience) and Transformative Capacity of Social-Ecological Systems. *Ecology & Society*, 18(1).
- Wondolleck, J. M., & Yaffee, S. L. (2000). *Making collaboration work: Lessons from innovation in natural resource management*. Island Press.
- Yohe, G., & Tol, R. S. (2002). Indicators for social and economic coping capacity—moving toward a working definition of adaptive capacity. *Global Environmental Change*, 12(1), 25-40.
- Zellner, M. L., Hoch, C., & Welch, E. W. (2012). Leaping forward: Building resilience by communicating vulnerability. *Collaborative Resilience: Moving Through Crisis to Opportunity*, MIT Press, London, 39-59.

8. APPENDIX

Table 3: Timeline of Key Events

1944	Sustained Yield Forest Management Act allowed the creation of stewardship units.
1950	Lakeview Federal Stewardship Unit created- all biomass harvested must be used in the milled/processed in the community.
1993	Collins Companies receives FSC certification on Oregon lands
1996	Collins Companies Fremont Sawmill is the only mill left in the Lakeview area.
1998	Collaborative came together, and Lakeview Stewardship Group formed with the support of Sustainable Northwest.
2001	Lakeview Stewardship Unit was federally re-designated.
2002	The Lakeview Stewardship Group, in partnership with Sustainable Northwest, created the Lake County Resource Initiative (LCRI). In that same year, the Toolbox Complex Fire, which included the Grizzly, Winter, and Toolbox Fires, burned approximately 80,000 acres of the landscape. Chewaucan Biophysical Monitoring program was created.
2003	Ford Family Foundation conducted leadership training in Lakeview.
2005	Lakeview Stewardship Group drafted the first long-range strategy for the Lakeview Federal Stewardship Unit, articulating a shared vision for the future of the community and the forest.
2006	Chewaucan Biophysical Monitoring efforts expanded. The Lakeview Stewardship Group makes a shift in programmatic focus from “chasing salvage” towards thinning and restoration treatments in overstocked stands, also referred to as the “Green Program.”
2007	20-year MOU signed by stakeholders regarding biomass supply. Collins Pine Company secures a 10-year stewardship contract with the Forest Service, the first 10-year stewardship contract in the Pacific Northwest. Collins Pine invests in a \$6.8 million dollar small-diameter log facility retrofit at their local Collins Fremont Sawmill.
2010	Jim Walls testifies at the U.S. Senate subcommittee on Public Lands and Forests. Iberdrola Renewables wins contract to build a 26.2 MW biomass facility that will bring 20 permanent jobs into the community and at least 50 more jobs harvesting, processing, and transporting biomass. Iberdrola is unable to secure a long-term contract for the electricity and halts construction of the biomass plant. A cement foundation remains where the facility was cited.
2011	Lakeview Stewardship Group’s Collaborative Forest Landscape Restoration Project (CFLRP) proposal is submitted for the second time after the first proposal was not funded. The group is awarded \$3.5 million to implement restoration work on the Stewardship Unit.
2012	The Barry Point Fire burned nearly 93,000 acres, impacting more than 4 years of Green Program thinning treatments.

Table 4: Lakeview Stewardship Group 2011 Membership

Organization Name	Contact Name	Role
Retired FS	Chuck Graham	Resources
Concerned Friends of Fremont-Winema	Chuck Wells	Environment
The Wilderness Society	Mike Anderson	Environment
Collins Pine Company	Paul Harlan	Forest Products
OECD	Larry Holzgang	Economy
LCRI & SNW	Jane O'Keeffe	Process
SNW	Martin Goebel	Process
None	Mark Gaffney	Citizen
City of Paisley	Mark Douglas	Government
Action Realty	Deanna Walls	Business
None	Clair Thomas	Monitoring/Science
Town of Lakeview	Sandy Wenzel	Government
Retired Defenders of Wildlife	Rick Brown	Environment
Retired FS	Terry Sodorff	Resources
None	Mark Valens	Citizen
Fremont Sawmill	Lee Fledderjohann	Forest Products
LCRI	Arlene Clark	Process
LCRI	Jim Walls	Process
Lake County	Dan Shoun	Government
Iberdrola Renewables	Steve Jolley	Biomass
The Larch Company & Oregon Wild	Andy Kerr	Environment
Lake County	Brad Winters	Government
Lake County	Ken Kestner	Government
TNC	Mark Stern	Environment
TNC	Craig Bienz	Environment
ODF	Dustin Gustaveson	Forestry
Retired FS	Karen Shimamoto	Resources
FS	Fred Way	Forest Supervisor
FS	Allan Hahn	Acting DFS
FS	Rachelle Huddleston-Lorton	Acting Lakeview District Ranger
FS	Barbara Machado	Paisley District Ranger
FS	Jody Perozzi	SE Zone Planning

Interview Guide

1. What do you enjoy the most about the Lakeview area?
2. In what ways does wildfire threaten the way of life in the Lakeview area? Ecologically? Socially? Economically?
3. How long have you been involved in collaborative land management in the Lakeview area and what motivated you to get involved in collaborative land management in the Lakeview area?
4. What decision criteria does the Lakeview Stewardship Group/collaborative utilize in evaluating potential management strategies?
5. In what ways is the decision-making process nimble, in other words, what is its adaptive capacity to changing conditions or new information?
6. How does the Forest Service contribute to the collaborative? How has the Forest Service's role changed over time?
7. Tell me about the Barry Point Fire (August 2012).
 - How did it compare to past fires in the areas?
 - What was the impact of the fire on the forest? The larger ecosystem? The communities and people in the area?
8. Did previous fires in the Lakeview area prepare the collaborative to deal with the threats associated with the Barry Point Fire? How and why?
9. How successful was the collaborative response to the aftermath of the fire? (Have them explain.)
10. What were the biggest challenges for the collaborative following the fire?
11. What kinds of things would have helped the collaborative respond more effectively to the aftermath of the Barry Point fire? (e.g., specific types of capacity? Expertise? Resources?)
12. Other than that, what major lessons did the collaborative learn from the Barry Point Fire?
13. In what ways has the collaborative strengthened the capacity of the Lakeview area to respond to future wildfire or other threats? Are there examples where the opposite is true (i.e. ways in which capacity has been weakened)?
14. How does Collaborative Forest Landscape Restoration Project (CFLRP) status enhance the ability of the collaborative to accomplish land management goals? Are there ways in which CFLRP status limits your ability to meet goals?
15. Is there anything else that you'd like to share or that you think I should know?