

THESIS

BUILDING A PRESCRIBED FIRE PROGRAM ON THE COLORADO FRONT RANGE:  
THE ROLE OF LANDOWNER ENGAGEMENT

Submitted by

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## ABSTRACT

### BUILDING A PRESCRIBED FIRE PROGRAM ON THE COLORADO FRONT RANGE: THE ROLE OF LANDOWNER ENGAGEMENT

Despite recognition of the value of prescribed fire in scientific literature and policy, a number of factors impede its widespread implementation in the United States. Social acceptance of prescribed fire is a key factor, making consistent and effective outreach an important part of efforts to increase prescribed fire implementation. The Arapaho-Roosevelt National Forest, located in northern Colorado, has set a goal to increase the level of prescribed burning, on its land and at a larger landscape level when possible. As part of this effort it has been working to improve active stakeholder involvement and education about forest restoration planning and implementation, with special attention paid to those who might be most directly impacted by future prescribed fires.

Through a case study on the Arapaho-Roosevelt National Forest, this thesis analyzes: strategies the USFS and its partners have used to communicate to landowners and meet their goals; challenges and benefits associated with outreach; and how outreach has been perceived by its recipients. To address each of these questions, I interviewed 23 individuals from the US Forest Service, its governmental and non-governmental partners, and community members in the study area.

This thesis consists of four chapters: a brief introduction, a report of my findings developed for practitioners, an article intended for submission to a journal, and a conclusion. The US Forest Service report is a technical document which reviews the goals for outreach, strategies

employed to achieve those goals, how community members perceived strategies used, and researcher insight into how outreach might be improved for future projects. My findings show that outreach providers in the study area had two primary goals: to garner understanding of and support for forest restoration projects in the community, and to encourage private landowners to consider implementing projects on their own land. These strategies were emphasized differently based on the specific goal and the outreach recipients' phase of learning. The second stand-alone chapter, which will be submitted to a peer-reviewed journal, offers a comparison of outreach provider and recipient perspectives on goals and outreach strategies used. I found that most of the community members I interviewed perceived a high level of wildfire risk to their homes and other material assets, and that was often their reason for seeking information initially. Providers and recipients of outreach generally perceived that interactive strategies, such as project tours and personal communication, were the most effective in achieving their goals. However, providers faced problems with capacity for this type of outreach, and recipients struggled to find information independently after they had established a general understanding of forest restoration techniques. In each chapter, I offer recommendations for improving future outreach programs based on feedback from interview participants and my own observations.

Following initial data collection for this project, a prescribed fire in the study area escaped and was declared a wildfire. I conducted follow-up interviews with 16 of the original 23 interviewees to understand how outreach informed community members before, during, and after the escape, whether changes to the outreach program would or should be made following the escape, and whether community members' perspectives on forest restoration had changed after such an event. My conclusion chapter introduces key findings from these follow-up interviews, and summarizes key findings about initial interviews from the previous two chapters. Key

findings in this chapter show that outreach recipients prefer a standardized email notification system no matter what entity is burning, and that those who were supportive of prescribed fire before remained supportive after the escape.

Findings from this study can be used to improve the ongoing outreach program in this study area, while adding to existing literature on prescribed fire outreach and informing similar efforts in other locations. Further research in other communities is necessary to identify contextual factors that influenced my findings.

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## CHAPTER 1 – INTRODUCTION

Fire suppression policies dominated federal forestlands during much of the 20<sup>th</sup> century, halting the frequent fire regime that historically shaped many Western forested landscapes (Ryan et al. 2013). Recognizing fire's importance to ecosystem structure and function, forest restoration techniques are being utilized by the USFS to restore historical forest structure, resiliency, and forest health (Schultz et al. 2012, USFS 2015). A 2018 report by the USFS describes forest restoration as going “beyond management focused solely on restoring ecosystem characteristics consistent with the historical range of variability, and rather using the historical range of variability to understand the ecological drivers underpinning ecological resilience, or the capacity of an ecosystem to recover from disturbance without loss of inherent ecosystem functional characteristics” (USFS 2018, p. 1). This ambiguous term, associated with a growing body of scientific literature, is far more complex than the Society of Ecological Restoration's definition: “the process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed.” In this thesis, I refer to “forest restoration” using the former description; most often, this includes prescribed fire and mechanical thinning techniques in order to restore more typical forest structure (e.g. species composition, tree spacing, and tree age-class distributions) and forest processes (e.g. extent and severity of fire). While it is impractical for active management projects to match the acreage, fuel load, or seasonality of historical fires, understanding historical processes helps determine modern day restoration and fuel mitigation needs (Ryan et al. 2013, North et al. 2012).

Despite its growing emphasis in scientific literature and policy, a series of legal, logistical, and social challenges have barred the widespread implementation of prescribed fire in

the United States (Schultz et al. 2018). Researchers and practitioners alike have often emphasized the perceived importance of effective community engagement to garner social acceptance of prescribed fire, especially in the wildland-urban interface (WUI). The WUI has rapidly expanded since the 1990s, covering nearly 10% of the conterminous US and constituting 43% of new homes constructed between 1990 and 2010 (Radeloff et al. 2018). Smoke management complications, strict burn permitting, and density of built structures in the WUI can reduce the feasibility of large prescribed burns in these areas (Addington et al. 2020). Because wildfires in WUI areas can threaten property and human lives, research finds it is particularly essential to facilitate trust, understanding, and support of forest restoration and wildfire mitigation techniques among those living and working in the WUI (Toman et al. 2006). Relationship building and collaborative decision making may be a key to accomplishing management activities on public lands while delivering social, economic, and environmental benefits to the public (USFS 2015).

It is commonly assumed by fire managers that Smokey Bear's campaign against wildfire has led the public to reject wildland fire in all forms (Lichtman 1998). A study by Asah (2014) found that fire managers often anticipate negative responses from the public; this expectation can influence their outreach and management actions, whether or not negative public attitudes actually exist (Asah 2014). Contrary to these common assumptions, recent studies have shown that many citizens in the WUI and across the US possess a general understanding of the risks and ecological benefits associated with fire (McDaniel 2014, McCaffrey and Olsen 2012). Whether this understanding generates actual support or action depends on a number of factors including perceived risk, trust, incentives, and a sense of personal responsibility (McDaniel 2014, McCaffrey et al. 2011). Using a psychological perspective, van der Linden et al. (2015)

identified several possible explanations for the disconnect between environmental knowledge or attitudes and actual changes in behavior, including: the tendency to prioritize personal experience over rational analysis, the role of social norms and societal context, and the role of “psychological distance,” in which present day costs seem to outweigh uncertain future benefits and actions may not directly impact the person taking them.

Aside from cases of “model landowners,” who are highly motivated to participate in land management activities regardless of the outreach they receive, the traditional “transfer-of-knowledge” approach to natural resources outreach is often ineffective on its own (Langer 2008, Niemiec et al. 2019). Rather than one-way information flow, outreach should aim to be interactive and, if possible, be integrated into community conversation for neighbor-to-neighbor sharing (Schindler and Neburka 1997, McCaffrey and Olsen 2012).

While it is important to keep in mind that people utilize multiple sources throughout each stage of their learning process (Ardoin et al. 2013), interactive communication may be the most telling factor in whether an information source is useful and trustworthy (McCaffrey and Olsen 2012). Earned over time through personal relationships and establishing credibility, trust is essential for successful fire management in the WUI (McDaniel 2014). Trust plays a key role in minimizing disorder and facilitating compromise in natural resources decision-making; lack of trust has been cited as a key barrier to implementing management activities (Davenport et al. 2006).

While government agencies are generally perceived as trustworthy information sources, one study found that many WUI residents were unsatisfied with USFS outreach efforts related to prescribed fire (Paveglio et al. 2009). Non-federal partners often hold stronger relationships with landowners and possess more sophisticated outreach techniques than the USFS alone, and

collaborative groups can establish greater credibility within the community. Defined by Crona and Parker (2012) as “organizations linking diverse actors or groups through some form of strategic bridging process and that are more or less distinct from the parties they work to link”, bridging organizations have been explored as a way to connect stakeholders, managers, and decision-makers in the face of problems too large for a single entity to solve. Some key qualities of successful bridging organizations are their ability to create a politically neutral environment and promote knowledge utilization (Crona and Parker 2012). Established bridging organizations can help work through the challenges of necessary cross-boundary land management collaborations (Cyphers and Schultz 2018). It is important that the outreach entities within a collaborative effort establish consistent, jargon-free language to minimize mixed messages and misunderstandings (McDaniel 2014, Wright 2007).

A literature review by Dup  y and Smith (2018) found that fire professionals are one of the most understudied groups in the social science literature on fire. They note that filling this gap in the literature would provide a better understanding of the perceptions, strategies, and goals of those on the “front line” of fire management. Additionally, despite a growing emphasis in prescribed fire literature on the need for implementation of broad management goals to be tailored to local conditions and stakeholders (Toman et al. 2006, Schindler and Neburka 1997, McCaffrey and Olsen 2012), few empirical studies exist analyzing the factors that go into a successful customization.

The primary purpose of this study was to evaluate perceptions of strategies used by the USFS and its non-governmental and other government partners to communicate to local landowners about forest restoration, specifically focusing on outreach related to prescribed fire. This case study took place on the Canyon Lakes Ranger District of the Arapaho-Roosevelt

National Forest in Northern Colorado. At the time of this study, a series of prescribed fire and thinning projects were in progress on this District, including the cross-boundary Magic-Feather Collaborative Forest Restoration Project, which was located nearby three WUI communities and became a focal point of this study. I analyzed recent and ongoing prescribed fire-related outreach to landowners in the context of existing outreach literature, and the goals and perceived effectiveness of the outreach program from the perspectives of both the providers and recipients of information. Just after finishing initial data collection in Fall of 2019, a prescribed fire within the study area escaped and was declared a wildfire, now known as the Elk Fire. In light of this change, I expanded the project to evaluate what outreach strategies were used during the escape, how community members perceived the effectiveness of these strategies, and whether community perceptions of fire or outreach changed as a result of the Elk Fire.

To complete this project, I conducted two rounds of semi-structured interviews: initial interviews before the Elk Fire, and follow-up interviews after. Both the initial and follow-up rounds of interviews consisted of two major groups: outreach providers and outreach recipients. Providers are personnel who, in partnership with the Forest Service, designed and delivered forest restoration and prescribed fire-related outreach to local landowners; recipients are the community members who received outreach. Each group had its own interview guide designed to address my research questions (Appendix A). I conducted interviews with 23 people in the initial round, then conducted follow-up interviews with 16 of those people following the Elk Fire. In total, I conducted 39 interviews.

I conducted initial interview between April and October of 2019 and they usually lasted between 45 minutes and one hour. Some primary information I sought to gain from the initial “outreach providers” guide included: the goals of the outreach program, which techniques were

used and why, and how providers perceived the success of their outreach efforts. I interviewed eight providers, with at least one representative from most of the major entities involved in outreach. This was fairly representative of the outreach providers population. The outreach providers most directly involved in one-on-one communication and informational presentations gave us lists of outreach recipients that they had been in contact with, which I used as the primary source of my interview participants. I also used “snowball” sampling, asking participants for names of other potentially relevant subjects, to derive a list of other key players on both the giving and receiving ends of outreach (Glesne 2011).

The lists provided consisted of individuals or couples who owned land and were planning or had already completed forest restoration work on their land, had attended community charrettes or neighborhood association meetings, or had attended open houses and tours. I contacted a total of 36 people from these lists, and 15 agreed to participate in an interview. From the initial “outreach recipients” guide, I sought to understand what motivated landowners and community members to become involved in outreach programs, how they felt their questions or concerns were addressed, how they communicated with their fellow community members about what they learned, their perceptions of outreach program success, and their preferences for receiving information.

I conducted follow-up interviews between June and August of 2020. I sent interview requests to all 23 interviewees from the initial interview round and received 17 total responses. Of these, all eight outreach providers and eight outreach recipients agreed to participate in a follow-up interview. One outreach recipient declined because they had never heard of the Elk Fire. Seven outreach recipients did not respond. Follow-up interviews lasted approximately 30 to

45 minutes. Due to the COVID-19 pandemic, these interviews all took place via phone or online video calling platform.

Through the outreach providers' follow-up interviews, I sought to understand what strategies had been used to communicate about the Elk Fire, and if the outreach program would change in the aftermath of such an event. Through the recipients' follow-up interviews, I sought to understand whether or not outreach recipients' perspectives of prescribed fire as a restoration tool had changed, and how they perceived the effectiveness of the communication they received about the fire.

Each interview was recorded, transcribed through Rev.com, and the transcriptions were reviewed for accuracy. I analyzed interview data through a systematic process of coding, defined by Charmaz (2006) as "categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data." I used a thematic coding process in an online coding software Dedoose to sort segments of data into pre-determined categories based on my research questions (i.e. deductive codes) and any major themes that arose during the data collection process (i.e. inductive codes) (Saldaña 2015). Within these major themes, I created sub-themes that further sorted and explained the data, visualizing the process using a taxonomy or coding tree (Appendix B). Throughout this process I applied various theoretical and conceptual ideas to the data in the form of memos, which assigned meaning to the raw data (Charmaz 2006). The codes and memos I produced helped to organize my data and pick out key themes for my final reports.

In this thesis, I present the research findings from my initial round of interviews in two stand-alone chapters. Chapter 2, a technical report for the US Forest Service, explores the goals of the outreach program from providers' perspectives, what strategies were used to achieve them,

and how outreach recipients evaluated the effectiveness of each strategy used. It concludes with key insights that can be used to improve the existing outreach program and inform similar programs in the future. Chapter 3 is an article intended for submission to the *Journal of Forestry*. In this chapter, I compared and contrasted the perspectives of outreach providers and recipients to identify agreements or mismatches in goals or perceptions of effectiveness. I placed my findings in the context of existing literature, ultimately offering insight into how outreach can be better tailored to the target community. Finally, I present findings from my follow-up interviews, summarize overall key ideas from my thesis, and discuss limitations and opportunities for future research in Chapter 4.



## CHAPTER 2 – DESIGN, IMPLEMENTATION, AND EVALUATION OF PRESCRIBED FIRE OUTREACH ON THE COLORADO FRONT RANGE

### **Executive Summary**

#### *1. Study Overview and Approach*

Despite its growing emphasis in scientific literature and policy, a series of legal, logistical, and social challenges have barred the widespread implementation of prescribed fire in the United States (Schultz et al. 2018). The US Forest Service (USFS) has set goals to improve active stakeholder involvement and education in forest restoration planning and implementation, with special attention paid to those living in the wildland-urban interface (WUI) (USFS 2017). Consistent and effective outreach and communication surrounding fire is especially important considering real and perceived risks of fire to human well-being (Toman et al. 2006).

In 2019, our team conducted a case study of the outreach associated with a series of prescribed fire projects on the Canyon Lakes Ranger District of the Arapaho-Roosevelt National Forest, located along the Front Range of northern Colorado. One of the most prominent projects during the time of this study, which became a focal point in our interviews, was the Magic-Feather Collaborative Forest Restoration Project, a collective series of prescribed burns across public and private jurisdictions. Several governmental agencies and non-governmental partners delivered outreach to community members living near the boundary of planned projects. Outreach activities included prescribed fire and thinning project tours, home visit to landowners' properties to discuss upcoming projects in their area and how landowners could become involved, community meetings, presentations or booths at community events, email listservs, and social media posts. Our study examined the goals of giving and receiving outreach, evaluated the strategies used to achieve those goals, then identified challenges and benefits associated with

each strategy in order to provide recommendations for future outreach efforts in this area and elsewhere.

Our team conducted 23 semi-structured interviews during the summer and fall of 2019. Interview participants were from two groups: 1) outreach providers, including USFS staff and other agencies and partners who designed and delivered forest restoration and prescribed fire-related outreach in the study area; and, 2) outreach recipients, WUI community members who received information from outreach initiatives. We recorded, transcribed, and coded interviews to analyze their content.

## *2. Findings*

To achieve their ultimate goal of implementing forest restoration projects on a landscape scale, outreach providers designed the program to: promote understanding and acceptance of forest restoration projects near WUI communities, and convince private landowners to implement work on their own lands, often by facilitating funding and technical assistance. Target audiences were landowners in priority forest restoration areas, homeowners within a certain proximity of project areas, residents of mountain communities, and the general public. Although several outreach providers perceived that there was a vocal minority of people who did not support the USFS's forest management activities, all providers perceived that overall community response to outreach was mostly positive.

Collaboration among different land management entities emerged as a key factor in maximizing capacity for outreach efforts and implementing landscape-scale forest restoration efforts. Additionally, many providers felt that sharing consistent information across platforms would build credibility within the community. Each outreach provider held an unofficial, yet widely understood role in providing information to the community. For example, some outreach

providers held a stronger role in one-on-one outreach, while others focused more heavily on project implementation than sharing information.

Outreach providers faced social and logistical challenges in preparing their outreach program. Because they had a broad target audience, there was no single strategy for delivering information that would reach and resonate with every individual. They expressed difficulty in scheduling events around provider and recipient work schedules, and in adjusting methods based on different communities' preferences. Additionally, some outreach providers faced feelings of discomfort when contacting strangers uninvited. Lack of capacity for both outreach and project implementation was perhaps the greatest challenge for outreach providers; several participants noted that their ideal situation would be to hire an individual dedicated to outreach but that it was not feasible for their organization at the time.

Two common objectives that outreach recipients sought were gaining an understanding of forest restoration practices and securing funding and capacity for work on their own land. When recipients were the ones to initiate contact, they were usually seeking information about home protection from wildfire. Outreach recipients perceived that they benefited from outreach, gaining an increased feeling of safety and security, understanding of forest restoration practices, the feeling of being responsible community members, and an ability to share accurate information with neighbors.

Most outreach recipients expressed having very limited communication with their neighbors, often due to part-time residency or a preference for solitude in one or both parties; however, what little communication did take place was often related to wildfire preparedness. Some of our participants belonged to a local grassroots organization which designated "neighborhood captains" to share information about fire mitigation and wildfire preparation with

their neighbors. Others were involved in cross-boundary forest restoration projects with their neighbors.

Both outreach providers and recipients perceived that the most effective outreach platforms were one-on-one communication, home visits, and tours of forest restoration areas. Providers and recipients also both perceived that presentations at existing community events were effective. For outreach providers, this was considered to be especially effective for initiating contact with new people. After gaining a basic knowledge of forest restoration, most outreach recipients preferred to receive ongoing communications via email. Aside from the NextDoor phone application (“app”), which many community members used to stay informed, social media was not perceived by recipients to be an effective avenue for meeting outreach goals in this study area. Unidirectional outreach methods, like press releases, non-interactive community meetings, and social media were also not perceived by providers or recipients to be as effective in achieving their goals.

Most outreach recipients perceived tours and one-on-one contact to be very useful for developing a base understanding of forest restoration concepts; however, after that initial phase of learning, they were unsure where to find information about further learning opportunities or answers to new questions. Additionally, a few private landowners interested in implementing forest restoration projects expressed a belief that their project goals did not align with the outreach providers’; this was sometimes attributed to the ambiguity of the term “forest restoration,” which outreach providers often used to generally refer to a broad array of management goals and techniques.

### *3. Conclusions*

Our study supports calls in existing literature for outreach that is interactive, population-specific, facilitates neighbor-to-neighbor sharing, and acknowledges the learning process. We have also developed additional conclusions that highlight the successes and address the challenges identified by our participants. First, using a suite of outreach methods can help reach the greatest number of people in each target audience and at different phases of learning. While one-on-one outreach and outreach events are overall considered to be the most successful strategies, supplemental methods can be useful to grab people's initial attention, reach part-time residents or residents who are not very involved in the community, and follow up with people who no longer require such in-depth methods. Additionally, collaboration between land management entities can be useful in avoiding overlapping efforts and reaching broader audiences. Within such a collaboration, delegating outreach responsibilities across collaborators can help ease the capacity burden and build credibility in the community. Finally, personal relationships with recipients and the overall community may be key factors in effective outreach. Creating opportunities for feedback within these relationships can help providers to understand and match the goals of their recipients, and can help overcome the challenge of only hearing from the vocal minority. Finally, logistical assistance in the form of access to grants, labor, forest inventory, or management plan-writing can be one of the most important strategies for meeting the goal of encouraging landowners to plan projects on their land.

### **Introduction**

Wildfires in wildland-urban interface (WUI) areas threaten human lives and property and complicate fire response. Prescribed fire and mechanical tree thinning are among the techniques utilized by the US Forest Service (USFS) to restore historical forest structure, resiliency, and

forest health, and mitigate risks to people and communities (Schultz et al. 2012, USFS 2015).

Studies indicate that in many places, mechanical thinning alone cannot restore ecological processes like nutrient cycling and fine fuel reduction without the subsequent application of prescribed fire; thinning and burning together most consistently yield positive effects on fire behavior, overstory survival, and regeneration compared to thinning or burning alone (North et al. 2012, Kalies and Kent 2016).

Despite federal initiatives, the total USFS prescribed fire acreage from 2008 to 2018 increased less than 1% compared to the previous decade (NIFC 2018). Although a recent study that interviewed land managers across the western United States found that most land managers cited capacity for implementation, limited incentives, and local conditions as the key barriers to prescribed fire implementation (Schultz et al. 2018), there remains a common perception that public support for projects is another key factor in prescribed fire implementation, especially in the WUI, where citizens are most directly affected by prescribed fire projects (Toman et al. 2006, USFS 2015).

Contrary to the common assumption that Smokey Bear's campaign against wildfire has led the public to reject wildland fire in all forms, recent studies have shown that many citizens in the WUI and across the US possess a general understanding of the risks and ecological benefits associated with fire (McDaniel 2014, McCaffrey and Olsen 2012). Whether this understanding generates actual support or action depends on a number of factors including perceived risk, trust, incentives, and a sense of personal responsibility (McDaniel 2014, McCaffrey et al. 2011). Additionally, the geographical context in which people live or own land can affect their real and perceived risk level, their goals, and their management decisions, and outreach information

geared to the region can promote a deeper understanding of individuals' situations (Dup  y and Smith 2018).

One potential way to combat barriers related to public acceptance of fire is through increased outreach to forest communities to build trust and support for fire management practices. Recent studies have used principles of adult learning from psychology and education literature to support a paradigm shift toward engaged, participatory outreach methods that deliver messages in a way that is both relevant and relatable to the target audience (Toman et al. 2006). Rather than one-way information flow, research finds that outreach should be interactive and, if possible, be integrated into community conversation for neighbor-to-neighbor sharing (Schindler and Neburka 1997, McCaffrey and Olsen 2012). There is a growing emphasis in prescribed fire literature on the need for implementation of broad management goals to be tailored to local conditions and stakeholders (Toman et al. 2006, Schindler and Neburka 1997, McCaffrey and Olsen 2012). A growing body of literature applies to conservation initiatives theories of behavior change, the human learning process, and communication; however, many of these theories have not yet been applied and tested on a prescribed fire outreach program.

We evaluated forest restoration-related outreach that took place between March 2018 and October 2019 on the Arapaho and Roosevelt National Forests and Pawnee National Grasslands (ARP). The study area was located along the Colorado Front Range. The USFS has set goals to improve active stakeholder involvement and education in forest restoration planning and implementation, with special attention paid to those living in the WUI (USFS 2017).

The ARP has been working on forest restoration projects to mitigate the risk of catastrophic wildfires, enhance the health of important nearby watersheds, and restore a healthier forest. To achieve these goals across a broader landscape, they have emphasized cross-

jurisdictional projects, collaborating with partners where necessary (USFS 2018). Alongside and intermixed with the boundary of the Canyon Lakes Ranger District's Magic-Feather Collaborative Forest Restoration project are fragmented parcels of private land that ultimately comprise three large WUI communities. As part of broad outreach efforts set by the ARP and the USFS as a whole, personnel with the ARP and its partners have prioritized forest restoration-related outreach to these communities.

The outreach program consisted of a range of activities provided by several different governmental agencies and non-governmental partners. Some of the key players included: the USFS, which was responsible for the largest parcels of land and had the greatest capacity for project implementation; the Natural Resources Conservation Service (NRCS), which provided one-on-one outreach to landowners who were considering implementing projects; the Coalition for the Poudre River Watershed (CPRW), which facilitated many of the outreach events and helped with some one-on-one outreach; and the Nature Conservancy (TNC), which was often responsible for implementation of projects on private land. Outreach activities included prescribed fire and thinning project tours, home visit to landowners' properties to discuss upcoming projects in their area and how landowners could become involved, community meetings, presentations or booths at community events, email listservs, and social media posts.

The following research objectives guided this study:

- 1) Identify the goals of providing the outreach and understand the strategies engaged by agencies and partners to meet those goals.
- 2) Identify the perceived outcomes of outreach efforts from the perspectives of providers and recipients, including challenges and benefits experienced.



- 3) Use lessons learned to inform future outreach efforts for this case study and on a broader scale.

## **Assessment Methods**

To complete this project, our team utilized qualitative data in the form of semi-structured interviews. Semi-structured interviews are designed to facilitate a deeper understanding of intricate underpinnings of human perceptions (Glesne 2011). Our sample consisted of two groups, outreach providers and outreach recipients. We defined outreach providers as those who created and dispersed information about forest restoration within the study area; most commonly, this included professionals from local, non-profit, and federal land management entities. Outreach recipients are defined as people who sought out or received information about forest restoration, and consisted of landowners and WUI community members. We developed separate interview guides for each of these two groups, which offered exhaustive lists of questions designed with our research objectives in mind. A total of 23 confidential interviews took place between April and October of 2019.

Our initial list of outreach providers included representatives from CPRW, NRCS, and the USFS, who we were aware had connections to existing outreach projects. Throughout the process, we used “snowball” sampling, asking participants for names of other potentially relevant subjects, to derive a list of other key players on both the giving and receiving ends of outreach (Glesne 2011). The primary information we hoped to gain from the outreach providers included: the goals of the outreach program, what techniques had been used and why they were chosen, and how managers perceived the success of their outreach projects. Our outreach provider sample consisted of eight key individuals from five different agencies and partners who together were responsible for much of the outreach in the study area.

These outreach providers gave us an initial list of outreach recipients that they had been in contact with, including people who owned land, had attended community charrettes or neighborhood association meetings, or had attended open houses and tours. We contacted 36 of these people and 15 agreed to participate in an interview. In our interviews with outreach recipients, we focused on their motivations to seek information, how they felt their questions or concerns had been addressed, how they communicated with fellow community members about what they learned, their perceptions of outreach program success, and their preferences for receiving information.

Separating our interviews into two groups with separate interview guides allowed us to understand the perspectives of both the providers and the recipients of outreach. Each confidential interview lasted approximately 45-60 minutes and took place at a location of the participants' choice. Interviews were recorded, then transcribed by a third-party company, Rev.com. Our analysis consisted of a thematic coding process, where we sorted segments of data into several pre-determined categories based on our research questions (i.e. deductive codes) and other major categories that arose organically during the data collection process (i.e. inductive codes) (Saldaña 2015). We wrote memos based on common ideas across excerpts and interview participants. The findings in this report are derived from the perceptions of our interview participants.

## **Findings**

### *1. Outreach Provider Goals*

For most outreach providers, the overarching goal was to implement forest restoration projects on a large, landscape scale. The purpose of these projects was wildfire mitigation, watershed protection, wildlife habitat improvement, and restoration of a more natural fire

regime. The priority areas determined to meet these goals fell across jurisdictional boundaries, creating a need for forest restoration on both public and private lands.

To meet this overarching goal, outreach was designed to accomplish two primary objectives: promote understanding and acceptance of forest restoration projects near WUI communities; and encourage private landowners to implement work on their own lands. Building credibility, promoting acceptance of projects nearby, preventing misinformation, and showing positive results from previous projects were the highest priorities for most outreach providers. Providers believed that developing familiarity with community members and acceptance of projects, often referred to as “social license,” would help ease planning through NEPA, prevent backlash to projects, and achieve the goal of getting more projects implemented.

The objective of encouraging private landowners to implement projects was specifically designed to meet cross-boundary burning objectives, and most providers tended to prioritize it beneath promoting understanding within the general community. Due to the physical and financial scope of implementing thinning or prescribed fire projects, a key focus of several providers was on facilitating funding and technical assistance for landowners to hire a third-party contractor to implement the work.

Though not originally defined as a goal, collaboration among outreach entities emerged as an important strategy for maximizing partners’ capacity for outreach, avoiding overlapping efforts, and building credibility through consistent messaging. Providers emphasized the perceived importance of consistent messaging through many voices; several mentioned the use of standardized language to ensure consistent communication and to avoid creating a perception of mixed messages. Each entity held an unofficial, yet well-understood role in outreach and implementation. Through these roles, which arose organically as the collaborative effort

developed, outreach providers believed that they were able to present a number of different angles and allow recipients to choose their level of engagement with forest restoration.

*Because we work with all of these different partnerships, we can come to the table with a menu. If you don't want aggressive cutting, then potentially utilize this grant program and this partner ... Being able to provide a package that the landowner can sort of select how they want to be involved has been really advantageous. Because they don't feel like ... they're either on board or they're excluded from everything. We can do something in between. (Outreach Provider)*

*We've read about [thinning]. And then [NRCS] talked about it. And then we went to a Nature Conservancy presentation and he had slides ... And then [CPRW] talked about it. And then by the time you have that many people telling you, it just sort of filters in, and I think with prescribed burning it's the same sort of thing. ... It becomes part of your thinking. But the first time you hear about it, it certainly isn't. (Outreach Recipient)*

## *2. Strategies and Content Used by Outreach Providers*

The target audience for outreach depended on which goal providers were focusing on. To promote understanding and acceptance of prescribed fire projects, outreach providers generally targeted landowners and homeowners within a one to three-mile radius of the project. To encourage individuals to implement projects on their private land, providers targeted landowners within “priority areas,” selected based on their property’s location, size, machine accessibility, or watershed value. Most forms of outreach were open to the general public; however, they were still particularly geared toward residents in WUI communities near forest restoration projects.

Outreach providers perceived that they were most often the ones initiating contact. However, they hoped that by doing more visible projects, landowners in the area would see positive results and seek information and capacity to conduct projects on their own lands. Despite this common perception, we interviewed several recipients who initiated contact first, and several outreach providers noted that the number of individuals in the target audience

initiating contact had been increasing as forest restoration efforts became more visible and as information spread through word of mouth.

Providers used a suite of strategies to initiate contact with a broad base of people (Table 2). After making initial contact, providers utilized many techniques to deliver the outreach content, including in-person events, one-on-one communication, and unidirectional information sharing. Events generally consisted of prescribed fire and thinning project tours, community meetings, open houses, and presentations at community events. One-on-one outreach included personal email or phone communication, home visits, and occasional door-to-door outreach. Unidirectional outreach, or one-way information delivery, included social media, news releases, listservs, posting on the NextDoor app, publications, and flyers/brochures.

Home visits often took place upon request from the homeowner to inquire about defensible space; meanwhile, door-to-door outreach was to inform homeowners about upcoming projects that might affect them. Unidirectional outreach usually notified community members of upcoming events or projects. With most strategies, providers emphasized question-and-answer.

To facilitate an understanding of fire ecology and restoration, outreach providers offered information about forest ecosystems, the roles of different partners, prescribed fire equipment and training, and the project planning process. Providers often pulled in researchers, firefighters, and other partners to share this information.

*I think there's still a perception that ... the U.S. Forest Service just goes out and drops a match whenever they feel like it because it's their land. That couldn't be any further from the truth ... People need to know how dialed in that is, how professional those people are, how many people are out there, onsite, how many trucks. They need to see the effort instead of just seeing the smoke. (Outreach Provider)*

Outreach content was often tailored to the goal that was being emphasized. No matter the goal, nearly all outreach strategies covered big picture topics like the purpose of forest restoration,

**Table 1.** List of strategies utilized by outreach providers to initiate contact with people in their target audiences.

<b>Outreach Providers' Strategies for Initiating Contact</b>	<b>Description of Strategy</b>
Sign-in sheets	Available at events, tables, presentations, community meetings, etc. for folks interested in receiving additional information in the future.
NextDoor app	A popular app used as a "hub" to make connections and share information with fellow community members.
Other social media	All online media except the NextDoor app; most commonly, this included Facebook and Twitter.
Geo-fencing	A method used to target advertisements and notifications at electronic devices within a certain geographic area.
County records	Names, contact information, and property information of county residents, particularly those within priority restoration areas
Mailers	Postcards and letters with information about upcoming events or forest restoration projects
Presentations	One or more outreach providers speaking to an audience about forest restoration, often in a guest speaker role at community meetings. Outreach providers noted that this was a good strategy for reaching people who might not have otherwise attended an outreach presentation about forest restoration.
Information booths/tables	Informational tables set up at community events
Flyers, brochures	Informational leaflets handed out or posted around town.
Press releases	Most often used to inform people that forest restoration is going to take place in their area.
Phone calls, emails	Using information gathered from county records and event sign-in sheets.
Community meetings	Outreach providers invite community members to discuss upcoming projects

the phases of treatments, planning processes, and expert explanations. Different outreach providers used different framing for the way they shared their information. Some outreach providers chose to frame forest restoration using worst-case scenario imagery like the High Park Fire or high-profile California wildfires. Others avoided fear-based messaging.

*Overall what works best to get people's attention, to get them paying attention to this? To be blunt, a fire in the area. The time I had the best results was immediately after the High Park Fire, as far as how many people came [to an outreach event].* (Outreach Provider)

*One of the things I do try to avoid when I talk to people is saying, "Your house is going to burn down." ... Threatening people is not a motivator. It's more about, what do you care about? Are you interested in how your forest evolved? Are you interested in fire as a positive factor? In water quality? What are your interests and motivations? ... Instead of, "Watch out for scary fire." (Outreach Provider)*

Existing literature does not find a linear connection between fear and behavior change. Public health and safety literature suggest that fear-based messages, or "threat appeals," rarely result in the desired behavior change, except in cases where response efficacy (the belief that a certain behavior will negate the threat) and self-efficacy (the perception that one has the ability to perform the behavior) are already high (Carey et al. 2013, Peters et al. 2013). Additionally, conservation literature relating to behavior change cautions that fear-based messages should only be used with caution, as they can often result in unintended consequences; when a threat seems too far away, people feel less of a need to act, but when it is too close, it can reduce their sense of self-efficacy to mitigate the danger. Evidence suggests that, to promote efficacy, fear-based appeals should be moderate and accompanied by specific actions to avoid the threat (White et al. 2019, USFS 2006).

### 3. Outreach Recipient Goals

Outreach recipients who owned land most commonly sought information about home protection from wildfire. Many landowners perceived that their homes were at risk of being lost

to wildfire; oftentimes this sense of risk was directly attributed to the High Park Fire, which narrowly missed the community in 2012. Recipients also sought to gain a general understanding of forest restoration practices in the community, often because they were concerned about potentially risky fire management activities taking place in their community. Another common motivation for seeking information was a personal interest in wildfire, natural resources, or community protection.

Once landowners understood the purpose and methods of forest restoration and developed an interest in implementing it on their own properties, they realized they were ill-equipped to do the work themselves. They also commonly sought information and assistance to secure funding and capacity opportunities to have forest restoration done on their land.

Outreach recipients often shared wildfire preparedness information and forest restoration learning opportunities with neighbors and fellow community members. Most outreach recipients expressed having very limited communication with their neighbors, often due to part-time residency or a preference for solitude in one or both parties; however, what little communication did take place was often related to wildfire preparedness. Many of the outreach recipients we interviewed fit the description of model landowners (Langer 2008), acting as formal or informal community leaders. Several were current or former “neighborhood captains” for a local, grassroots wildfire-preparedness organization, spreading information about wildfire preparedness and response to their community on a volunteer basis. Others expressed a perceived sense of responsibility for spreading accurate information, keeping part-time neighbors informed while away, and protecting the community.

Recipients received mixed responses to their efforts to initiate contact with neighbors. There were several instances of neighbors sharing information about outreach providers or



events, including: a participant that gave contact information for an outreach provider with their neighbor; people sharing information about tours or inviting neighbors to attend; a neighborhood fire captain that recruited another neighborhood captain at a tour; and local clubs or organizations giving contact information for other groups for outreach providers to target.

#### *4. Evaluations of Strategies Used*

Pulling in a variety of speakers for presentations and teaching the ecological basis of forest restoration were perceived by outreach recipients to be effective strategies for building understanding and acceptance of projects. Recipients wanted to understand the basis of forest restoration in their community, and valued hearing input from multiple speakers such as researchers or firefighters, who they perceived to be “experts.” Additionally, recipients cited seeing historical photographs, learning about historical fire regimes, understanding fire behavior, and seeing the phases of a prescribed fire or thinning as being particularly useful in building their understanding of forest restoration concepts.

Tours and visual examples were perceived by both providers and recipients to be an effective approach for encouraging landowners to implement forest restoration projects. Several recipients stated that they would not have implemented work without first seeing positive examples in their area. This experience also helped recipients express ways they would like to adjust their projects to fit their needs. For example, one person did not like the appearance of burn piles during the tour and opted to have the debris removed manually from their property instead; another decided to implement a thinning after seeing how “natural” it could look.

*We've already worked with one of these landowners. We've got two more on board. The two that we have on board now are interested because they saw what was going on across the street. ... The acres speak for themselves. (Outreach Provider)*

*What I liked about the tour was to see that they had created a meadow with clusters of trees of different ages. So it wasn't just that every 10 feet there was a tree, and*

*then 10 more feet, there was a tree. It looked very natural. ... I think maybe prior to that, my vision might have been “Oh, you’re just going to measure off this grid and then cut everything down that doesn’t fit the grid pattern.” ... It made me feel a little more positive about that. (Outreach Recipient)*

For landowners who chose to implement projects, information about opportunities for logistical assistance was considered to be an extremely valuable aspect of outreach. Logistical assistance often included funding projects, completing forest inventories, providing information about which providers offer what resources, and sharing details on how landowners can implement work on their own. Most of the outreach recipients who had already implemented or were preparing to implement forest restoration projects on private land said they would not have had to the capacity to do so without grant funding. Receiving grants, and even help finding and applying for grants, were cited by many participants as one of the greatest benefits of outreach.

While encouraging landowners to implement projects on their own land, outreach providers and recipients alike emphasized the importance of relationship-building, answering questions, and flexibility. Several outreach providers said that, when convincing landowners to implement projects on their land, they would wait to bring up that topic until the very end of the conversation, spending most of their time getting to know the person and their needs. Providers felt that, through this one-on-one contact, they earned credibility; recipients appreciated having a reliable expert on hand for specific questions about their property.

*And then getting to meet with him, talk with him, so that we had a feel for somebody that cared about what we thought. [He] didn’t just come out and get permission. ... he went out of his way to help us contribute to the process and listened to our concerns. (Outreach Recipient)*

With the exception of the NextDoor app, unidirectional outreach was not perceived by providers or recipients to be as effective as the other methods described. Many outreach recipients mentioned that they were active on the NextDoor app, which is designed to connect

neighborhood residents, and that it was a good way to spread information about tours and other community events.

The app allowed local organizations to register but was more difficult for large non-profits or federal agencies to access. Providers used the app to correct misinformation and to provide contact information to those that posted questions or comments about ongoing projects. One outreach provider described a shift away from press releases and non-interactive community meetings, toward more engaging and extensive outreach methods.

*They had these stapled pamphlets with pictures of things. You flip through that and, quite honestly, I don't know how much that anchored any of my thinking around this stuff. I mean, it was good knowledge, it was good to see. ... But being there and seeing it, and having a tour from somebody who's doing it and out there on a day-to-day basis is the best way to get people engaged. (Outreach Recipient)*

Communication and building personal relationships were perceived by both outreach providers and recipients to be the most effective way to achieve their respective goals. Outreach recipients commonly noted providers' ability to answer questions as a useful aspect of personal communication. Most of the outreach recipients referred to at least one outreach provider by their first name; in some cases, recipients knew the provider's name but not the organization they worked for.

After gaining a basic knowledge of forest restoration, most outreach recipients preferred to receive ongoing communications via email. For example, many participants wanted one-on-one communication at first, but once they got their questions answered and felt comfortable with the forest restoration practices happening in their area, they preferred to get notification-style communication via email. Additionally, participants that worked with outreach providers to implement forest restoration on their land generally preferred intermittent communication to take place over email.

When asked their recommendations for outreach, two of the most common responses from outreach providers were to be patient and to understand the target's values (e.g. ecosystem health, personal connection to the landscape, or wildfire preparedness). Other recommendations included transparency, consistency of communication, dispelling rumors, and expressing a genuine concern for recipients. Both providers and recipients mentioned the importance of following up, flexibility, and not "preaching" information.

Many providers and recipients alike shared the perception that the overall community perceived non-governmental partners as more credible than the USFS. These people felt that partners could support the USFS by facilitating outreach events and spreading a consistent message. Although this was a common perception across both sides, only one outreach recipient we interviewed actually expressed a mistrust in any government agency, stating their perception that NRCS aimed to profit from a forest thinning while CPRW would not. However, this mistrust did not seem to be due to NRCS being a government agency.

## 5. *Perceived Outcomes*

The paragraphs below describe how providers and recipients perceived outcomes related to providers' goals for the program.

### 5.1. *Goal #1: Understanding and acceptance of forest restoration*

Almost every outreach provider we interviewed perceived a positive response to outreach and forest restoration projects. Though several expressed difficulties with a perceived vocal minority of unsupportive people, all providers concluded that responses to their outreach were mostly positive.

*The only surprise has been how universal the positivity is ... I think we sort of assume there's going to be pushback, and then we're surprised when there's not. But I don't know that we have any reason to believe that there will be pushback.*  
(Outreach Provider)

Various providers also believed that their outreach had changed peoples' perceptions, that they successfully built trust in the community, that they convinced people to implement work on their private lands, and that they were overall satisfied with the outcomes of their outreach initiatives. Several outreach providers perceived that a positive ripple effect was created by presenting positive success stories, and reaching model landowners.

Outreach recipients said they gained an increased feeling of safety and security, in addition to gaining knowledge and understanding of forest restoration practices. Many outreach recipients saw knowledge gained as a benefit in itself. One participant mentioned that having a reliable contact person and a suite of accurate resources to consult with questions was a major benefit of receiving outreach. Landowners who implemented forest restoration work on their land expressed that they felt safer should a wildfire come through. While recognizing that there was no guarantee that any home would survive a large wildfire, many seemed satisfied that their home would at least be "defendable." Other recipients who either did not own land or had not implemented restoration work on their land expressed that they felt safer simply knowing forest restoration was going on in the area. Several mentioned that, because they now understood the process of forest restoration and were kept up-to-date on current prescribed fire projects, they no longer felt scared when they saw smoke near their home.

*I've become a lot more comfortable about the conditions that have to exist, and the protocols that they use to determine when to do those burns, and how to do those burns, and what kinds of protections are in place. (Outreach Recipient)*

## *5.2. Goal #2: Forest restoration on private lands*

Several outreach providers perceived a shift toward a more "fire-adapted" community, which they attributed to outreach. Outreach providers told of at least two instances where community members initiated contact with outreach providers about getting work done on their

land, and several of the outreach recipients we interviewed had initiated contact on their own. One outreach provider mentioned that, as the community as a whole became familiar with the purpose of prescribed fire, they were beginning to shift the focus of outreach content from *why* prescribed fire is done to more logistical information on *how* it is done.

*It's very difficult to do the implementation because there's a lot of resistance, or likely resistance. So that public outreach is critical, and it takes time to establish. In communities where we've been working for a decade aggressively managing the fuels ... those communities are becoming much more fire adapted communities. ... I've been in these communities long enough that I've seen that progression.*  
(Outreach Provider)

Receiving information about, and even help applying for, grants was seen as one of the greatest benefits of outreach for landowners who wanted to implement forest restoration on their private lands. Lack of capacity (money, labor, time, and experience) was the greatest challenge outreach recipients faced in meeting their implementation goals. Because grants were more likely to be awarded to larger parcels of land, several landowners reached out to apply for grants together or join the same contract for forest restoration projects. At least two individuals that had implemented work said that they would not have done so without having received funding.

Though not identified as an initial goal, many recipients saw the opportunity to exercise responsibility as a community member as a benefit to receiving outreach. Outreach recipients felt that they were better neighbors when they implemented fire mitigation work on their lands or shared accurate information with others in the community. Several accepted leadership roles in the community by becoming Neighborhood Captains, and few enthusiastic individuals said that they planned to give presentations or allow tours on their property to showcase the forest restoration projects done on their land.

*There was a gentleman who called who said, "My friends told me there's smoke in Red Feather Lakes. What's what all about?" And I was able to very quickly get to those emails and read directly what had been sent – not to try to summarize in my*

*words, which might not be completely accurate ... I could just read that gentleman the email that had been sent from official sources. So that has been very helpful.* (Outreach Recipient)

*I guess [our project] been a very successful project from [outreach providers'] perspective. So, they often bring other landowners, agencies, to the land to show them what a conservation program looks like ... We're trying to be a part of this larger area solution to forestry issues and watershed issues ... We didn't do it for this, but we like being a resource for people that are considering this kind of work.* (Outreach Recipient)

## 6. Challenges and Critiques Associated with Outreach

Outreach providers faced several difficulties in their efforts to initiate contact. First, providers possessed a general understanding that they were unable to reach all people from every target audience. This was one of the most common challenges amongst outreach providers, with several expressing a feeling that they would never be able to reach the minority of people who had negative preconceived notions about forest restoration practices. Additionally, providers noted that different people within the target audience have different accessibility to outreach. Some community members did not have access to phone or internet. Many were part-time residents, and outreach providers expressed more difficulty in reaching these residents as they are not always in the area and may have been less invested in home protection than those who lived there full-time.

*It's interesting because not everybody up there has email. Not everybody up there has the internet. Some of them have dial-up. ... So, that challenge of how do you reach everyone ... We just have to be creative and not just rely on the newest and best technology because that doesn't always work in these communities.* (Outreach Provider)

*I'd say even less than half [of the homes in the study area] are occupied year-round ... A lot of people see the area as a place to come up for recreation. They don't really want to spend a couple hours on their Saturday that they're hanging out up at their cabin in the mountains to come to a class.* (Outreach Provider)

One provider said that mailing information seemed to be helping with this issue, as it reached a broader audience than other efforts could. Another provider said that their solution was to “get creative” in outreach, using road signs, a pre-recorded phone line, and providing business cards to crew members. On the other hand, outreach providers had to take care to avoid contacting the same people. One outreach provider expressed the importance of open communication with other entities to ensure they weren’t doing double work or repeating information to people who had already received it.

Additionally, some outreach providers felt uncomfortable initiating contact, particularly when information was gathered through county records. At least one outreach provider expressed feeling like a “used car salesman” when contacting strangers about forest restoration. Despite their personal discomfort, in most cases outreach providers perceived that their efforts were effective.

*There was some sleuth work on our part, looking up the county assessor’s records to try to get these people’s contacts and either cold calling or sending out an email. So that was a really hard part of it because you’d feel like a used car salesman or a telemarketer or something. Calling them and people are like, “What?” (Outreach Provider)*

*Part of our digital marketing effort ... it’s creepy, but it’s called geo-fencing. And when people drive into a certain zone, they’re like, “Oh, look, there’s this organization that can help me thin my forest.” Which, to me, is totally creepy. (Outreach Provider)*

Several outreach providers cited capacity for outreach as a key challenge, currently and looking toward the future. The most common capacity issues were a lack of time and money for thorough outreach. Several noted that their ideal situation would be to hire an individual dedicated to outreach, but that was not feasible for their organization at the time. Most outreach providers also agreed that while one-on-one communication seemed to be the most effective for achieving all goals, they simply did not have the time and resources available to dedicate to that



for every project. Additionally, scheduling conflicts often arose in balancing providers' and recipients' work schedules, personal schedules, and the schedules of part-time residents.

In addition to capacity-related challenges, providers experienced challenges managing relationships with such a large target population. One outreach provider discussed that, in providing outreach to multiple communities, it becomes important to keep track of differences in each community's preferences for outreach content and delivery. Managing relationships on a community-by-community basis became even more difficult in larger communities, where there was greater complexity in preferences and a higher likelihood of a negative vocal minority speaking out against the project. One provider's solution to this challenge was to use the same, broad suite of techniques in every location, but calibrate the ratio of various techniques based on what the target audience is most receptive to.

*I feel like that's a good chunk of my job is knowing what information people want, how best to get it to them, and how best to reach those communities that are impacted by our activities and our decisions. (Outreach Provider)*

Many outreach providers perceived that a vocal minority dominated much of the feedback they received, which may have been due to community perceptions of the organization providing outreach. One person said that what little feedback they received was generally negative. Some government agencies perceived that outreach recipients disapproved of the government. These perceptions did not seem to be community-wide, but were factors in outreach for some individuals. Despite this being a large part of the feedback received, nearly every outreach provider agreed that these negative responses were mostly outliers.

*If you're a federal employee long enough, you develop a healthy understanding that there's a wide range of opinions about whether or not the federal government should exist and what our role should be. ... It's really just about personal experience and you spend enough time on phone calls with people accusing you of all kinds of horrible things ... There's going to be some subset of people who don't have any interest in what the federal government has to say. (Outreach Provider)*

*I measure things more on how many pieces of negative feedback do we get, as opposed to how many people come out and say “Good job.” ... because they don’t really come out and pat us on the back. ... I think the missing link is the feedback and I don’t know what that feedback is. (Outreach Provider)*

Several outreach recipients perceived a mismatch in goals with outreach providers. At times this mismatch in goals seemingly had to do with language. The ambiguous term “forest restoration” was often used by outreach providers to encompass a range of forest management techniques and objectives including forest health, resilience to wildfire, and restoring a historical ecosystem structure. Landowners who were unfamiliar with the jargon term sometimes interpreted it to simply mean “restoring the forest” to a more natural state. Thus, those who were interested in other goals, such as wildfire mitigation or wildlife habitat, did not perceive forest restoration to be a match for their goals.

*“[Our goal] is more like landscape design than it is just flat out forest management. I’m taking a broader perspective in how we want the land to function, how we want it to serve [our needs, rather than just trying to re-establish the historic, 1800s ponderosa forest. I know that’s important too ... It’s just not for us locally.” (Outreach Recipient)*

The above quote illustrates one outreach recipient’s direct interpretation of the term “forest restoration.” In this case, the outreach recipient chose not to cancel a thinning project due to a perceived mismatch in goals with the providers; they later found a different land management entity who they felt offered more flexibility in implementation options. Flexibility for implementation was another challenge that several outreach recipients faced, with several hesitant to plan projects with a land management entity out of concern that they would not have enough say in the process. Some wanted to maintain a certain amount of trees for aesthetics or privacy during the thinning process, but felt that they were not given that option.

One consistent challenge across participants was difficulty in gathering information independently during their later phases of the learning process. Multiple participants expressed that the only way they knew to get reliable answers to their questions was to personally contact their primary outreach provider.

*I don't know where to find other opportunities. ... We're hoping that we have good enough relationships now with various people in the National Forest Service and Park Service and Larimer County ... so that when an opportunity presents itself, they'll say, "Hey, let's reach out to [them] and see if they are interested in being a part of it." (Outreach Recipient)*

There were several additional challenges, but these were mostly inconsistent, isolated events. These included: getting all the different organizations confused, providers not being proactive in their communication, and a perception that outreach providers were unfamiliar with the local landscape. Additionally, there was a disconnect in perceptions where outreach providers felt that they were most often initiative contact, despite several outreach recipients we interviewed expressing that they were the ones who initiated contact. In one of these cases, the landowner was disappointed that they were not in the target audience. One landowner sensed that the outreach provided was “preaching to the choir,” meaning those that attend outreach events already know about and are supportive of the concepts being taught.

## **Conclusions**

Most of our interview participants, on both the providing and receiving ends of outreach, indicated that they perceived the outreach program to be successful. Existing literature notes a non-linear connection between environmental understanding, attitudes, and behavior change. Trust in the implementers, a sense of risk, incentives, a sense of personal responsibility, and geographic context all contribute to acceptance and support. Our study supports calls in existing literature for outreach that is interactive, population-specific, facilitates neighbor-to-neighbor

sharing through model landowners, and acknowledges the learning process; we have also developed additional recommendations for how to more effectively tailor that outreach to a community. The following paragraphs include both recommendations directly from interview participants and researcher recommendations that highlight the successes and address the challenges identified in our interviews.

Coordination and collaboration amongst key organizations and agencies can be utilized to share capacity and ensure consistent repeat messaging. As seen in this case study, delegating outreach responsibilities across collaborators can help ease the capacity burden, build trust in the community, and reach more people from each target audience. All of these can contribute to achieving the overarching goal of implementing cross-boundary forest restoration projects.

Using a suite of outreach methods and an incremental approach to outreach content can help reach the greatest number of people in each target audience at different phases of learning (USFS 2006). As one outreach provider said, sometimes it was necessary to “get creative” in the number and types of approaches used. While one-on-one outreach and outreach events are overall considered to be the most successful, supplemental methods can be useful to grab people’s initial attention, reach part-time residents or residents who are not as involved in the community, and follow up with people who no longer require in-depth communication. A common challenge for outreach recipients was conducting independent research after gaining an initial understanding of the concepts. To address this challenge, outreach providers should focus on sending consistent notifications of ongoing projects, and give outreach recipients reliable resources they can access on their own. This suite of strategies can be adjusted based on community preferences; these preferences can be understood through community relationships and audience segmentation.

Getting to know the community as a whole and building personal relationships are key foundations of effective outreach. Many outreach recipients, particularly those who chose to implement forest restoration work on their private land, referred to their primary outreach provider by their first name. In some cases, they could remember the provider's name, but not the organization they worked for. On a community level, one outreach provider noted that in working with two different communities, they would often emphasize different outreach strategies. For example, one community might be very active on social media, while another community just a few miles away does not have a strong social media presence. These relationships can be tailored and strengthened through audience segmentation and feedback opportunities (Kusmanoff et al. 2020).

Opportunities for feedback, such as surveys or focus groups, can help providers identify different sub-groups within the community, understand their different values and barriers, and match the goals of their recipients (McKenzie-Mohr and Schultz 2014, Kusmanoff et al. 2020). Audience segmentation can also help to identify whether different sub-groups prefer one type of organization over the other (Kusmanoff et al. 2020); for example, if a specific subset of the community commonly disapproves of the federal government, collaborators can tailor outreach to that audience to include stronger representation from local or non-profit entities.

Feedback can also be useful on an individual level for strategies like home visits. For example, one outreach recipient said that, when an outreach provider visited his property, he received lots of “big picture” information, but wanted to hear more about his individual parcel of land. This could be an easy fix; however, the outreach provider likely did not know that was an issue.

Finally, logistical assistance in the form of grants, labor, and forest inventory can be a critical tool for increasing a sense of self-efficacy among target landowners. Many landowners indicated that they would not have implemented any forest restoration work without such assistance, and some cited this as the most beneficial part of their interactions with agency personnel.

## CHAPTER 3 – COMPARING LAND MANAGER AND COMMUNITY EVALUATIONS OF A COLORADO PRESCRIBED FIRE OUTREACH PROGRAM

### **Introduction**

Prescribed fire and mechanical forest thinning are among the techniques increasingly utilized by the US Forest Service (USFS) to restore natural fire regimes and mitigate effects and risk of uncharacteristic wildfire. Recognizing a need to increase the pace and scale of forest restoration, the USFS has been trying to reintroduce fire to the federal forest landscape as a larger-scale, potentially cost-effective tool to support forest restoration and wildfire hazard mitigation (Cohesive Strategy 2014).

Researchers and practitioners alike have often emphasized the importance of effective community engagement to garner social acceptance of prescribed fire, especially in the wildland-urban interface (WUI). The WUI has rapidly expanded since the 1990s, covering nearly 10% of the conterminous US and constituting 43% of new homes constructed between 1990 and 2010 (Radeloff et al. 2018). Smoke management challenges, burn permitting from air quality regulators, and density of built structures in the WUI can reduce the feasibility of large prescribed burns in these areas (Addington et al. 2020). Because wildfires in WUI areas can threaten property and human lives, research finds it is particularly essential to facilitate trust, understanding, and support of forest restoration and wildfire mitigation techniques among those living and working in the WUI (Toman et al. 2006). Relationship building and collaborative decision making may be keys to accomplishing management activities on public lands while delivering social, economic, and environmental benefits to the public (USFS 2015).

It is commonly assumed that Smokey Bear's campaign against wildfire has led the public to reject wildland fire in any form, but research finds that many citizens in the WUI and across

the US possess a general understanding of the risks and ecological benefits associated with fire (McDaniel 2014, McCaffrey and Olsen 2012). Nonetheless, a study by Asah (2014) found that fire managers often anticipate negative responses to agency projects from the public.

Expectations of negative feedback can make managers less willing to interact with the community, whether or not negative public attitudes actually exist (Asah 2014). An expanding body of literature examines the application of learning, behavior change, and social marketing theories to the broad field of natural resources conservation; although, these theories have not been widely applied in the context of communication efforts specifically relating to prescribed fire.

In a study that investigated community perceptions of timber projects, Olsen et al. (2012) found that many active community members were unaware of common management terms and concepts, and that positive interactions community-agency interactions were a strong predictor of acceptance of projects. Negative interactions were often attributed to a sense that personnel were not being transparent about projects or did not meaningfully consider public input for projects. To address these findings, Olsen et al. (2012) recommend a “two-level” approach in which the first level is a general information campaign that develops understanding of concepts, and the second level is a more focused campaign that delves more deeply into individual projects, provides opportunities and opens up opportunities for interactive learning.

Traditional frameworks of environmental behavior change date back to at least the early 1970s and feature a linear connection between increased knowledge, environmental attitudes, and pro-environmental behavior changes. While knowledge is one important factor in behavior change, the progression has proven far more complex than these early models suggest (Kollmuss and Agyeman 2002, Ardoin et al. 2013).



When designing an outreach program, it is important to identify what the primary end goal is, whether it is: 1) attitude change, which involves generating acceptance or support for a concept; or 2) behavior change, in which the target recipients perform a certain task or form a new habit (Kusmanoff et al. 2020). Where behavior change is the desired goal, McKenzie-Mohr and Schultz (2014) recommend narrowing down the target behavior to one that is broken down into the smallest unit of action, achieves a specific end goal, has a direct impact, has a high probability of being adopted, and is not already a common behavior.

Once a specific change in behavior has been isolated, it is important to understand what barriers might prevent the target audience from adopting the behavior; these are often identified through focus groups, surveys, existing literature, or observation (McKenzie-Mohr and Schultz 2014, White et al. 2019). Barriers can be internal, as a result of low self-efficacy or psychological biases, or external, as a result of physical or financial limitations (Kusmanoff et al. 2020). For more effective outreach to target populations, it is important to acknowledge local contexts and different “publics” (Ardoin et al. 2013). Within a community, there are a number of sub-groups, which can be identified and tailored to in outreach based on their motivations, values, and barriers in a process of “audience segmentation” (Kusmanoff et al. 2020).

One way to develop and share effective messages is by understanding and utilizing “social norms.” Both descriptive norms, social standards for what people normally do, or injunctive norms, standards for what people usually approve or disapprove of in a community, should be referenced in communications as a way to normalize a desired action (White et al. 2019, Kusmanoff et al. 2020). Descriptive norms are generally most useful to highlight a positive norm in the community (e.g. “Dozens of people in your community have already taken action!”); highlighting an unsustainable norm in the community can have the unintended consequence of

normalizing an undesirable behavior (White et al. 2019). Injunctive norms can be used to promote an action's desirability amongst the target's family members, community, and local land managers (USFS 2006).

In addition to normalizing certain behaviors in a community, outreach can be used to facilitate sharing of information amongst community members, a process often referred to as social diffusion, diffusion of innovation, or peer-to-peer sharing (McKenzie-Mohr and Schultz 2014, White et al. 2019, Green et al. 2019). Peer-to-peer sharing, which can be facilitated in discussion groups or at outreach events, has shown to be a useful tool in recruiting less involved community members, as it reduces the hierarchical structure of the traditional transfer-of-knowledge approach to information sharing. The transfer-of-knowledge approach creates a dichotomy between professional experts and the landowners they reach out to, resulting in a feeling of inequality and a disconnect in values and motivations (Schindler and Neburka 1997, McCaffrey and Olsen 2012). Landowners may be more likely to engage with other landowners for practical knowledge gathered through similar lived experiences, while they would turn to outreach providers for research, legal advice, and logistical information (Kueper et al. 2012). One way for outreach providers to facilitate peer to peer sharing is through "opinion leaders" or "model landowners," a unique audience who are highly motivated to participate in land management activities (Langer 2008, Ma et al. 2012, USFS 2006).

The "stages of change" model of behavior-change suggests that different strategies are necessary depending on a person's stage of readiness to act (Ardoin et al. 2013). For example, mass media outlets tend to be useful in the early stages of agency outreach, when the primary goal is general awareness and basic information dispersal. However, in the later stages when the goal is to change attitudes or behavior, this method tends to be less effective (McDaniel 2014).

The stages of change model of strategies can be paired with an incremental approach to message content. For example, Monroe et al. (2006) recommend a defensible space messaging campaign that first focuses on removal of dead vegetation, then shifts to replacing flammable plants, then addresses home construction; meanwhile, corresponding community events or work teams can help build the efficacy to act on each step along the way.

To address both attitude and behavior change goals, it is important to keep in mind that people utilize multiple sources throughout each stage of their learning process; however, ultimately, interactive communication may be the most telling factor in whether an information source is considered useful and trustworthy (McCaffrey and Olsen 2012). Existing literature suggests that engaged, participatory outreach methods are more effective in delivering messages in a way that is both relevant and relatable to the target audience (Toman et al. 2006).

The purpose of this study is to compare the perspectives of fire management personnel, who provided information to the public about forest restoration, and members of the public, who received information, in the context of existing literature on effective public engagement.

Comparing these perspectives side by side and with the literature can offer a holistic understanding of why certain strategies were used, and how they might be improved in a way that achieves the goals of both the providers and recipients of information. We sought to answer the following research questions:

1. What were outreach providers' goals for the outreach program, and what strategies were employed to achieve those goals?
2. What were outreach recipients' goals, and how did they evaluate the effectiveness and areas of improvement for the outreach program in meeting their needs?

## Methods

This case study on the Canyon Lakes Ranger District of the Arapaho-Roosevelt National Forest reports on research examining how the USFS worked with its non-governmental and other government partners to communicate with local landowners about forest restoration. We primarily focused on outreach related to a cross-boundary prescribed fire project known as the Magic-Feather Collaborative Forest Restoration Project.

To complete this study, we used qualitative methods and conducted a case study. The use of qualitative methods allowed us to learn the underpinnings of key players' perceptions and opinions. Located along the Colorado Front Range, the Arapaho and Roosevelt National Forests and Pawnee National Grasslands (ARP) have set goals to increase the pace and scale of forest restoration projects, with a particular emphasis on areas around three WUI communities. A series of projects, including the more than 6,000 acre Magic-Feather Collaborative Forest Restoration project, were designed to meet these goals through the use of mechanical thinning and prescribed fire on both public and private lands. Because the projects take place nearby and within WUI communities, and occur on both public and private parcels of lands, leadership on the ARP consider social license to be a key component in successful implementation of the projects. Thus, the USFS and its partners in this area have facilitated an ongoing outreach program to members of the community.

We collected data using semi-structured interviews, using a list of questions but allowing flexibility in the interview structure so interviewees could focus on areas of interest or expertise. Our interview participants were separated into two groups: the "outreach providers" and "outreach recipients." Outreach providers were those who played a major role in developing and implementing forest restoration projects and related outreach. The interview guide for this group

focused on goals, strategies used, the role of collaboration in building an outreach program, and perceptions of how the program had resonated with their target audiences. We used purposive sampling to identify the original five-person sample for this group, then used “snowball” sampling, a method where interview participants give recommendations for additional interviewees, to identify and interview an additional three participants. These eight interviewees represented nearly all of the primary organizations involved in developing and implementing the outreach program in this area.

Outreach recipients were landowners, community members, and members of the general public who received some form of information from outreach providers. The interview guide for this group of people included questions about recipients’ goals for receiving information, their evaluations of strategies used, and preferences for receiving information moving forward. Outreach providers from the Natural Resources Conservation Service (NRCS) and Coalition for the Poudre River Watershed (CPRW) provided us with initial lists of potential interviewees in this group. The USFS also has email lists dedicated to outreach; however, we chose to use the lists from NRCS and CPRW because they were comprised of people who had been more actively involved in targeted outreach, attending at least one outreach event or receiving one-on-one outreach. We contacted 36 people from these lists, and 15 accepted our invitation to be interviewed.

Data was collected during the summer and fall of 2019. Interviews usually lasted 45 minutes to an hour and were recorded with consent from interview participants. They were conducted at a location of the interview participant’s choice. We had interviews transcribed by a third-party and reviewed transcriptions for errors. These transcripts were uploaded to a qualitative data analysis software known as Dedoose, where we used a systematic process of

coding to organize and analyze our data. We created codes based off of our research questions, then developed additional codes as we reviewed the transcripts and new ideas emerged. From these codes, we derived the results and conclusions found in the following few sections of this report. Integrated throughout this report are quotes from interview participants. These quotes were selected because they succinctly illustrate notable concepts in interview participants' own words. To give context to the quotes while maintaining confidentiality, quotes are labeled with whether the participant is an outreach provider or recipient, and what their general role within the outreach program was.

## **Results**

### *1. Outreach Providers' Goals and Strategies Used*

A number of partners worked together to provide information to the public. Some key players in the collaboration were the US Forest Service (USFS), Natural Resources Conservation Service (NRCS), Coalition for the Poudre River Watershed (CPRW), The Nature Conservancy (TNC), and local volunteer fire departments. The USFS held the highest capacity for implementing projects, as they manage the largest parcels of land in the area and had the greatest number of employees. NRCS focused their efforts on outreach and funding for large parcels of private land. Once NRCS facilitated the projects, TNC often was the organization to actually implement on private lands. CPRW, a local non-profit organization, was able to facilitate funding for smaller parcels of private land and helped landowners plan flexible projects according to individual preferences. CPRW was also the primary organizer of many outreach events, though they would pull in representatives from as many partner organizations as possible to speak. Outreach providers heavily emphasized the positive impact of collaboration on their work, noting that without this shared capacity and consistency of messaging across multiple

organizations, the outreach program could not be nearly as extensive. The following quotes summarize the perceived importance of communicating collaboratively.

*When I run into [a community member], and I'm saying the same thing NRCS or the Nature Conservancy ... if we're all speaking the same language and have the same intent, I think it catches on in the community much better than if people are getting slightly mixed messages. (Outreach Provider)*

*I think we're trying to communicate as a coalition, ... as opposed to just the federal government doing its own thing. We're all in this together. (Outreach Provider)*

The primary goal for most outreach providers was to develop an attitude of understanding and acceptance of forest restoration projects planned in the community, often called “social license” by outreach providers. This goal was especially important to interview participants from the USFS and TNC, likely because they were the organizations with the capacity to implement burns. This “social license” was largely perceived by land managers to be an important piece in implementing forest restoration projects. Informational campaigns with this goal were generally open to the public, but were most strongly geared toward community members who lived nearby projects and would be most directly affected. In the following quote, one outreach provider described a necessity to make the public feel comfortable seeing fire used as a management tool.

*We need to facilitate that information and get that to the public so that they understand why we may be working with fire differently on the landscape ... We have to develop that social license so that they're comfortable. (Outreach Provider)*

To promote an attitude shift toward understanding and acceptance of forest restoration projects, outreach providers shared the scientific and practical basis for their techniques. Informational topics included fire behavior, forest ecology, and the prescribed fire planning process. They also explained practical details about different partners' roles, required training, and use of equipment.

A secondary goal of the outreach program was to promote behavior change in private landowners by encouraging them to implement forest restoration projects on their own lands. These campaigns were focused primarily on larger landowners and those in highest-priority fire mitigation areas. For landowners considering implementing projects on their land, providers often assisted in the planning process, helped find and apply for grants, and sometimes conducted forest inventories or provided other logistical assistance. Though all outreach providers were supportive of this goal, it was most heavily emphasized by NRCS and CPRW, which were the primary organizations responsible for facilitating projects on private lands. All of the outreach providers sensed that, most often, they were initiating contact with community members to share information. They hoped that more community members, particularly landowners wanting to implement on their property, would begin to reach out to them with questions as projects became more widely accepted and results became more visible across the community.

Outreach providers utilized a suite of techniques to deliver information. They perceived events such as prescribed fire and thinning tours, community meetings, open houses, presentations at community events, and socials to be very useful, particularly in reaching new people and developing understanding and acceptance of forest restoration. Nearly all of the providers perceived that one-on-one outreach in the form of home visits and personal phone or email communication were the overall most effective strategies to achieve each of their goals, especially when encouraging landowners to implement projects on their property. The strategy most broadly perceived to be least effective was unidirectional information delivery such as social media, press releases, and print media.



Though most noted that it was too early to determine outcomes of the outreach initiative, providers were overall in agreement that the response so far seemed very positive. Most said they got some negative feedback, but expressed a belief that it came from a vocal minority, and that most community members were supportive of projects after learning about them. At the time of interviews, providers from NRCS and CPRW were working on several projects on private land, and they felt that the outreach program had been successful in recruiting some of these people.

## *2. Outreach Recipients' Goals and Evaluations of the Outreach Program*

There seemed to be a strong sense of wildfire risk among the community members. Of 15 outreach recipients interviewed, 11 primarily sought information about wildfire protection for their homes and the overall community. Six of these referenced the 2012 High Park Fire as a main motivator for seeking such information. For some, the High Park Fire marked the first time they perceived that their home or community could be at risk; others always knew fire was a possibility, but the fire acted as a catalyst for taking mitigation action. Below, two landowners discuss their sense that their homes are at risk based on their experience with the High Park Fire, and how that sense of risk motivated their support of fire mitigation practices.

*Well, you see fires on TV. When I moved [to this area] in 2012, that was the summer that the High Park Fire was burning. So I think wildfire in general was at the top of my mind as I thought about the risk to any development or investment I made on the property. (Outreach Recipient)*

*So I think behind everything, my real goal is to have this place not burn down. We lost a cabin in [the High Park Fire]. ... So I fear fire, but at the same time I really appreciate the fire mitigation work that's being done around here. I'm excited about it and I support it. I want to participate if I can. (Outreach Recipient)*

Two more outreach recipients said that wildfire mitigation information was a goal, but not a primary one. Just two did not mention fire mitigation as a goal in any way; each of these people emphasized overall “forest health” as their primary concern when seeking information or

planning projects. Most outreach recipients differentiated between forest health and fire mitigation, with forest health being focused on factors like tree health and wildlife abundance, and fire mitigation specifically relating to protecting structures.

*It's about restoration and health of the forest. ... Fire mitigation was probably fifth or sixth on the list. (Outreach Recipient)*

The term “forest restoration,” was often used by outreach providers to encompass a number of goals including restoring a certain fire regime, wildfire risk reduction, and overall forest health; however, several outreach recipients interpreted the term in a more literal sense to simply mean “restoring the forest” to a more historical state. Because recipients’ goals ranged from defensible space to wildlife abundance and beyond, the term “forest restoration” was not always perceived to resonate with their goals.

*“[Our goal] is more like landscape design than it is just flat out forest management. I'm taking a broader perspective in how we want the land to function, how we want it to serve [our needs, rather than just trying to re-establish the historic, 1800s ponderosa forest. I know that's important too ... It's just not for us locally.” (Outreach Recipient)*

Despite outreach providers’ common perception that they were usually the ones initiating contact, several of the community members we spoke to had initiated one-on-one contact first. Many of our interviewees fit the description of “model landowners” (Langer 2008), which could explain why they both initiated contact with outreach providers and accepted our invitation for an interview. In the following quote, a small landowner who fell outside the boundary of the main collaborative burn area describes the lack of communication they received before they reached out personally.

*It wasn't outreach. ... Nobody outreached to us. I asked. (Outreach Recipient)*

Outreach recipients generally echoed outreach providers’ perceptions of what strategies were the most effective. By far, they perceived that one-on-one communication was the most

useful form of outreach, especially for landowners planning to implement projects; presentations at community meetings and recommendations from neighbors were among the most effective ways to initiate contact. The following quote shows how important it was for one outreach recipient to receive personalized communication and have specific questions answered before deciding to implement a thinning project on their land.

*[It was important] to meet with [CPRW representative], talk with him, so that we had a feel for somebody that cared about what we thought. [He] didn't just come out and get permission and say, 'Yeah, we're going to take care of this and we're the experts and you don't have an opinion.' It was just the opposite. I think he went out of his way to help us contribute to the process and listen to our concerns. (Outreach Recipient)*

Visual examples, including tours of project areas, were described by receivers as the most useful in understanding the goals and outcomes for forest restoration projects. Several recipients said that seeing historical photographs helped them visualize how fire behavior might behave differently in treated and untreated land, and helped provide a baseline of what is “natural” in these landscapes; many also described how visually pleasing project areas were after implementation. At tours and presentations, outreach recipients appreciated hearing from “experts” and being able to ask questions.

*What I felt [was] good about that particular presentation is I felt like we had some actual experts talking to us. I looked at that as very positive. ... We weren't listening to somebody who didn't know a whole lot more than I did. (Outreach Recipient)*

*Well, I'm a person that learns by seeing and doing. So I think the tour that [NRCS] took us on was invaluable. To be able to go up there to the other land and see first-hand and walk around and see the crew up there working. That's huge. (Outreach Recipient)*

Visual examples were also considered to be extremely useful for landowners planning to implement forest restoration projects on their own lands. Several of these landowners noted that they chose to implement after seeing positive results elsewhere in the community, and some used

examples in the community as reference when expressing what sorts of treatment they wanted on their land. Multiple people shared the assumption that a thinning project would result in a uniform grid formation of trees across the property; the idea of such a negative aesthetic deterred them from wanting to implement. The visual examples seemed to help combat this negative assumption and encourage them to implement on their own land. Below, two landowners, who were both in the early phases of planning forest restoration projects on their land at the time of interviewing, discuss how important visual examples were in their decision to make such a drastic change on their land.

*I think seeing [forest restoration projects] is fundamental. My attitude is in the process of changing. I'm still resistant [to thinning] to a certain extent. ... I want to take my wife to [a tour] to show her ... She's probably more resistant than me, but I think once we get out there it's going to be similar to a meadow that we have. There are a few trees and they are super healthy ponderosa and it is a lovely place. ... I think imagining more of our property like [the meadow] is something I couldn't have done without going to that [tour]. (Outreach Recipient)*

*The tour helped me see that it could look very natural, anything that was done. It wouldn't be an artificial-looking grid. We could still have the wildlife habitat and have a healthier piece of property at the same time. (Outreach Recipient)*

Social media did not seem to be an effective form of communication in this community, with the exception of the NextDoor phone application (app), which many outreach recipients said they used to gather up-to-date information about things happening in the community. Besides this app, only one interview participant in this category mentioned getting information about forest restoration from social media.

After gaining a basic understanding of the need for forest restoration, most outreach recipients still wanted to be kept up-to-date about what to expect in their area, but no longer needed the in-depth explanations about how and why it was happening. At this point in the learning process, most outreach recipients preferred to get ongoing information in the form of

email notifications. Email was also the preferred venue for intermittent communication with landowners during the process of planning projects on their land.

None of our outreach recipient interview participants expressed a preference for non-governmental partners over government agencies. Several interviewees did, however, share the outreach providers' perception that this was the case in the community as a whole. The following quotes are from two landowners who supported government projects, but perceived their neighbors would not.

*I'm wanting to get a hold of my neighbors to see if they are interested [in collaborating on a project]. I get the sense they're kind of anti-government people. Actually, the neighbor that I met the very first week I was here, in that very first conversation he told me what idiots the National Forest Service are. They had been talking about prescribed burns and he said, 'I wouldn't trust them.'* (Outreach Recipient)

*I think there's a little bit of stigma still, especially with the older generation of ranchers. There's still a little bit of trepidation and hesitation to work with a governmental agency because no one wants to be told how to manage their land.* (Outreach Recipient)

In the case of our interview participants, who were generally supportive of forest restoration practices regardless of the organizational affiliation, preference toward one organization or another seemed to depend more on individual relationships. In several instances, particularly when discussing information they had received with Coalition for the Poudre River Watershed, outreach recipients could remember the first name of the outreach provider, but could not identify which organization they represented.

*As part of this tour that we did, I guess it was the folks from the – I'm going to get the name wrong – the watershed, Poudre River... something.* (Outreach Recipient)

*I don't remember the name of the non-profit that is organizing this. I wish I did because it seems like they're doing a really great job.* (Outreach Recipient)

At other points in each of the landowner interviews quoted above, the participant mentioned at least one CPRW outreach provider by their first name. This suggests that the personal relationship they built with the outreach provider was more influential than the reputation of the organization, and could even suggest that organizational reputation is tied to the outreach provider.

The greatest challenge that recipients faced in their efforts to gather information came after they had built a basic understanding of forest restoration. At this point, they no longer needed the extensive background knowledge given at tours, events, and through one-on-one communication; rather, they had specific questions and sought information about upcoming projects in their area. At this stage in their learning, many people expressed difficulty gathering information independently, with a few, like in the quote below, stating that they relied on personal communication from an outreach provider to learn about upcoming learning opportunities.

*We're still somewhat isolated. If [provider from NRCS] doesn't tell us about an opportunity, or somebody else tells us about an opportunity, I don't know where to find other opportunities. ... We're hoping that we have good enough relationships now with various people in the National Forest Service and Park Service [etc.], so that when an opportunity presents itself, they'll say 'Let's reach out to [them] and see if they are interested in being a part of it.'* (Outreach Recipient)

Several interviewees suggested that a collaborative website or notification system would be useful for gathering information on their own. Existing resources do not cover all different entities' prescribed burns, thinning projects, and wildfires in one place. The Northern Colorado Fireshed Collaborative, to which many of our outreach providers belong, was developing a website as of time of interviews which might address some of these concerns; however, we are unable to evaluate its content or effectiveness at this time. The following quote details one

outreach recipient's recommendation for such a website; several other recipients made similar recommendations.

*To be honest, sometimes I'm frustrated at how difficult it is to find fire information even when I'm actively seeking it. ... I think what would be really helpful is – I don't know exactly what the system would look like and I'm sure there would be drawbacks, but – if you could sign up for some sort of notification system in a similar way of severe weather notifications. And even pick a region, within 50 miles, or 100 miles, wherever, of any location and be notified by an automatic email any time there's a controlled burn, a spot fire, or an actively burning wildfire. It'd be nice to get those alerts in advance. ... I don't know. That may even exist already. But I haven't found it. (Outreach Recipient)*

## **Discussion**

Outreach providers' two primary goals were: 1) to promote attitudes of understanding and acceptance of forest restoration projects within the broad community; and 2) to encourage a behavior shift in landowners in priority areas in the form of implementing projects on their own lands. To achieve both these goals, they used a suite of practices including presentations at community events, project tours, social media, large email listservs, and one-on-one communication. The content of the outreach most often focused on the science and ecology of forest restoration, the project planning and implementation process, and the roles of different collaborators. When encouraging a behavior change in landowners, providers also shared information about opportunities for funding and capacity.

Nearly all of the outreach recipients interviewed perceived that their community was at high risk for wildfire. This sense of risk was what led most of our outreach recipients to seek information, with their primary learning goals being about home and community protection. Once they had learned more about forest restoration in the context of wildfire mitigation, they learned about the many other ecological benefits it can provide. These benefits, including

wildlife habitat and resiliency to disturbance, which often became additional goals for property owners to implement projects.

Outreach providers and recipients were generally in agreement about which strategies were the most successful in communicating information. Tours, events, and one-on-one information sharing, where outreach recipients could interact with providers and ask questions, were widely perceived to be the most effective strategies by both providers and recipients. Because many outreach providers expressed capacity for one-on-one outreach as a challenge, project tours are likely the most effective way to provide interactive and effective outreach to a wider audience.

Visual examples, like those of project sites visited during tours, were especially useful for outreach recipients who might have had negative preconceived notions about what fire or thinning would look like. These visual examples were also useful in encouraging landowners to implement work on their land. Perhaps the most impactful outreach strategies for landowners interested in implementing projects on their land were those that included assistance with funding, forest inventories, or labor; these tools helped landowners overcome capacity-related barriers and increased their sense of self-efficacy (White et al. 2019). Both groups also agreed that unidirectional information, including social media, was generally ineffective for this community, with the exception of the NextDoor app. This app was widely utilized by outreach recipients, perhaps because it is specifically designed to connect neighbors within a given community.

The term “forest restoration” was not always well understood by outreach recipients, nor was it perceived to resonate with some recipients’ goals for learning or project-planning. A 2018 report by the USFS describes “forest restoration” as going “beyond management focused solely



on restoring ecosystem characteristics consistent with the historical range of variability, and rather using the historical range of variability to understand the ecological drivers underpinning ecological resilience, or the capacity of an ecosystem to recover from disturbance without loss of inherent ecosystem functional characteristics” (USFS 2018, p. 1). This ambiguous term, associated with a growing body of scientific literature, is far more complex than the Society of Ecological Restoration’s definition: “the process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed,” which is closer to the interpretation held by many outreach recipients (USFS 2018). Language that includes scientific jargon is less accessible to non-expert audiences and is often ineffective in building understanding (USFS 2006); in this case, it also sometimes created the perception that providers were not addressing recipients’ goals.

Because the sense of risk in this community seemed to be the primary driver for recipients seeking information, outreach may be most effective if initially framed in the context of community protection from wildfire. This initial framing might capture the attention of a greater number of community members and increase the perception of matching goals; however, to avoid unintended consequences from fear-based messaging, the content of the messaging itself should highlight positive social norms, build self-efficacy, and incrementally introduce other benefits of the desired action (USFS 2006, Peters et al. 2013, McKenzie-Mohr and Schultz 2014, Ardoin et al. 2013). For example, within a conversation that begins with, “forest management can mitigate future wildfires in your community,” the primary content of the message might highlight: success stories of others in the community, creating a descriptive social norm; simple steps for creating defensible space or resources available to assist with larger projects, to build efficacy; and benefits outside of wildfire mitigation such as wildlife habitat and ecosystem

health, to address the goals that often arose after people gained a basic understanding of forest restoration techniques.

One fairly consistent challenge for outreach recipients was that they struggled to gather information independently after having gained a baseline understanding of forest restoration through outreach. In the future, outreach providers within the collaborative group might ease this burden by creating a consolidated website with selected resources, or providing a list of reliable, area-specific resources to people who attend outreach events or have a home visit.

Because folks that disapprove of projects would be unlikely to request a home visit, attend an outreach event, or sign up for a listserv, the way that we developed our sample is unlikely to have reached this segment of the population. Additionally, a potential limitation of our study is that if members of the unsupportive vocal minority had attended an outreach event, those who disapprove of the USFS might not have responded to our request for interview, as the request stated that our project was funded by the USFS Rocky Mountain Research Station. One way to combat this in the future would be to avoid stating a government affiliation when recruiting interview participants.

Finally, the lack of representation from this group could be attributed to the high volume of “model landowners” in our sample (Langer 2008). Model landowners would likely be the most motivated to dedicate time for an interview and to support land management actions in their community, no matter the land management entity’s affiliation. For this reason, our findings might be slightly skewed toward more positive perceptions of outreach and forest restoration projects. Our research is still relevant for reaching those who are most likely to attend outreach events or seek information; however, to better reach less-motivated community members in the future, outreach providers can actively facilitate peer to peer sharing and encourage model

landowners to recruit additional community members. Model landowners who are concerned about their reputation in the community can be targeted in outreach strategies that address questions of how community members might respond to recruitment efforts from their peers. If these landowners feel that there is a good chance of receiving a positive response from their neighbors, they may be more likely to start a conversation about forest restoration and recruit new people to speak with outreach providers (Kueper et al. 2012, Niemiec et al. 2019). Utilizing model landowners to share information can also help spread the burden of contact initiating, improving providers' capacity challenge for outreach.

Future research is needed to understand how place-based or contextual factors, such as the High Park Fire's impact on this specific community's risk perception, might impact interviewee motivations and perceptions in other areas. Additionally, this research discussed the perceived effectiveness of outreach strategies and identified preferences for information delivery; however, future research should include a control and intervention group to directly track which strategies led to changes in attitude and behavior change. As the USFS and its partners work toward achieving their forest restoration implementation and community engagement goals, the findings from this study can be used to guide more effective outreach strategies and content.

## CHAPTER 4 – ELK FIRE FINDINGS AND STUDY CONCLUSION

In this thesis, I examined a forest restoration-related outreach program on the Colorado Front Range, identifying providers' goals for program and recipients' evaluations of the strategies employed to achieve them. After analyzing these results, I conducted follow-up interviews for a longitudinal study of perceptions before and after the escape of a prescribed fire in the study area. I explored findings from my initial round of interviews in Chapters 2 and 3 of this thesis, with Chapter 2 acting as a comprehensive overview of all research questions, and Chapter 3 focusing in more on comparing and contrasting the perspectives of outreach providers and recipients. In this chapter, I report the key findings from my follow-up round of interviews, then summarize key takeaways from this thesis, discuss potential limitations and applications of my research, and outline opportunities for further research on this topic.

### **Findings from Elk Fire Follow-up Interviews**

#### *1. About the Elk Fire*

On October 15, 2019, The Nature Conservancy (TNC) began implementation of a prescribed fire as part of the larger Elkhorn Creek Forest Health Initiative. The project took place on the Ben Delatour Scout Ranch within the study area of this project. Due to an unexpected shift in weather parameters on the second day of the burn, the prescribed fire escaped its boundaries on October 16. The escape, which spread 82 acres outside the planned boundary and destroyed one outbuilding, was quickly declared a wildfire, now known as the Elk Fire (CDPS 2020). This event sparked an opportunity for a longitudinal comparison of perceptions of outreach and forest restoration before and after the escape.

## 2. *Methods*

We requested follow-up interviews with all 23 original study participants. From these requests, all providers and eight recipients agreed to participate. Six outreach recipients did not respond, and one declined because they had never heard of the Elk Fire. In total, I conducted 16 follow-up interviews. These interviews were shorter than the initial round, lasting 30-45 minutes each. Due to the COVID-19 pandemic, all follow-up interviews were conducted via phone or video calling software.

For a longitudinal comparison of perceptions before and after the Elk Fire, before each follow-up interview, I listened to the corresponding initial interview and wrote down key ideas and quotes that indicated their perceptions of forest restoration prior to the Elk Fire. I then coded follow-up interviews using the same major themes from the initial interviews, adding a code for “Elk Fire Experiences” to understand the range of impacts the fire had on the community members in this study.

## 3. *Outreach Providers’ Goals and Strategies Used to Achieve Them*

The most common goals for providing information during the Elk Fire were to share accurate information and remain transparent about the escape. Outreach was primarily geared toward WUI community members who were most directly impacted by the fire; however, a few outreach providers targeted media outlets as a way to reach a broader audience. To achieve their goals, providers utilized a suite of techniques including social media, public meetings, mass news outlets, and answering questions at meetings or from personal contacts.

Nearly all the outreach providers stressed the importance of collaboration in the aftermath of the Elk Fire. Although TNC headed the burn, the implementation itself was a collaborative effort, and providers across several entities felt it was important to release statements about the

burn, express support for TNC, and cross-post information on their own platforms to reach a wider audience. Many outreach providers shared the perception that false information spread quickly through the community during the fire; therefore, much of the outreach content was focused on dispelling rumors and sharing accurate information.

In the months following the fire's containment, outreach providers highlighted scientific data and visual examples of the burned area to show community members the ecological recovery and benefits of the fire. Several outreach providers from different entities attended a public meeting hosted by the Colorado Department of Public Safety (CDPS) in March 2020. At this meeting, CDPS released results from a review of the fire. During and after this event, outreach providers often focused on technical information about the fire's planning process and weather parameters. Outreach providers had planned a public tour to walk through the burned area the summer after the escape; however, the COVID-19 pandemic caused those events to be delayed, and at the time of interviews, providers were preparing a virtual tour.

#### *4. Outreach Providers' Perceptions of Outcomes, Challenges, and Benefits*

Most outreach providers perceived that community response to outreach during the fire was very negative. Several providers felt that, prior to the burn, TNC either did not do enough outreach, or used ineffective methods for this community. The US Forest Service, which has implemented a number of successful prescribed fire projects over several years in this area, uses a standardized email listserv for each burn, in which they send email updates before, during, and after the burn. Multiple providers expressed that the community might have been more familiar with a notification technique similar to what the USFS uses. Some outreach providers noted that one positive outcome from having an existing outreach program in place was that they had

personal contacts in the community who felt comfortable coming to them with questions or concerns.

Outreach providers had mixed perceptions regarding the lasting impact the Elk Fire might have on the community. Moving forward, about half predicted a long-term negative effect on community perceptions of prescribed fire, and half predicted a positive or neutral long-term effect. A few of those who predicted a positive impact on community perceptions thought that the Elk Fire would remind people of the wildfire risk in their area, and motivate them to implement forest restoration projects on their land.

Many outreach providers outside of TNC expressed a challenge in making clear that the burn was not under their jurisdiction and referring questions to the source, while still expressing support and not portraying that they were deflecting blame. Similarly, several noted that it was difficult to strike a balance that highlighted the ecological benefits of the escape while acknowledging its negative social impacts. A few also noted that, even as a partner, it was difficult to find information when they were looking for it.

##### *5. Outreach Recipients' Goals and Evaluations of Outreach Strategies*

While the Elk Fire was active, most outreach recipients sought fire updates related to their safety, including containment status, what direction the fire was moving, and evacuation information. Following the fire's containment, about a third of the recipients interviewed did not seek further information. Others sought to understand what factors led to the escape, or to gather accurate information to share with others.

The most common avenue for receiving information was email, with all but one outreach recipient describing receiving some information in this way. About half of the recipients interviewed said that they received some form of personal communication with an outreach

provider who they knew prior to the Elk Fire. Additionally, several utilized the Larimer Emergency Telephone Authority, an emergency text alert system. Because this is an emergency alert system not usually associated with forest restoration projects, I was unable to interview an outreach provider representing this service. All but two outreach recipients were aware of community meetings that took place in the aftermath of the Elk Fire. About half of the recipients interviewed attended at least one community meeting in the aftermath of the burn; those who did not attend either were unaware that they were taking place or chose not to go because they did not feel personally impacted by the fire. Recipients had mixed evaluations of the meetings; some felt that all their questions and concerns were addressed, while others did not feel that there was enough information available at the time to warrant a community meeting at the time.

#### *6. Outreach Recipients' Perceived Outcomes, Challenges, and Benefits*

All of the outreach recipients interviewed expressed continued support for forest restoration projects in their community following the Elk Fire. Most said that their perceptions of prescribed fire had not changed at all as a result of the escape; a few said that, while still supportive of prescribed fire, in the future they would be more interested in learning the qualifications of those implementing burns. Their continued support was often attributed to a sense that wildfire risk in a landscape where fuel loads had not been reduced outweighed the risk of a prescribed fire escaping. Many outreach recipients also attributed the continued support to existing relationships with outreach providers. Several recipients said that they were always aware of the risk associated with prescribed fire, but that they “trusted” the implementers to do their best. At least five of the recipients were planning forest restoration projects before Elk Fire, including two who were planning prescribed burns. All five were still moving forward with the projects at the time of their interviews.



The greatest challenge outreach recipients faced was information accessibility during the fire. During the Elk Fire, most recipients lost electricity; with many also living in an area with no cell service, this made it difficult to get any information. Others expressed that there was not enough information available about the prescribed fire before it escaped or while it was an active wildfire.

### **Study Conclusions, Limitations, and Future Research Opportunities**

Outreach providers' goals for this outreach program were twofold: 1) to garner a general understanding and acceptance of forest restoration projects in the community; and 2) to encourage landowners to implement projects on their own lands. My findings suggest that community members are most likely to initially seek information about home and community protection from wildfire, but develop interest in other ecological benefits of forest restoration as they learn more. Therefore, I suggest that outreach framed in the light of wildfire mitigation and defensible space, that later dives into ecological benefits, might initially garner the most attention from the community. For landowners implementing forest restoration projects on their land, planning assistance and funding opportunities were often seen as the most useful forms of outreach. Visual examples were also especially important for landowners planning projects on their land, because it allowed them to picture what the results might be on their land. Project tours and presentations were perceived to be very effective in developing an understanding of forest restoration practices; however, outreach providers and recipients perceived that personal communication was the overall most effective way to achieve their goals. Findings from this study can be applied in a real-world context to improving prescribed fire outreach programs in this study area and elsewhere.

Following the Elk Fire, outreach providers had mixed opinions about the future of forest restoration in the community, with half predicting a long-term negative impact on community perceptions of prescribed fire, and half predicting a positive or no change. All outreach recipients I interviewed remained supportive of prescribed fire in their community, expressing a perception that the risk of wildfire was more severe than the risk of prescribed fire escaping. A few stated that they would now look deeper into the qualifications of those implementing the burn; however, they still supported the practice.

We identified three potential limitations for this study. First, because so many people in the “outreach recipient” sample matched the description of “model landowners,” the results and recommendations of this study may be biased toward the most involved members of the community. For example, nearly all participants (both providers and recipients) had a sense that the community as a whole has less trust for the government compared to its non-governmental partners. However, despite this widely shared perception, none of the interview participants personally felt this way. Because our sample was derived from lists of people who attended outreach events or received home visits, it was unlikely that the negative minority would have been recruited. A potential way to combat this limitation in the future would be to recruit participants through a broader avenue like community groups or neighborhood associations, or to include a less time-consuming data collection such as a survey. A survey method could be coupled with semi-structured interviews to give a general glimpse of the population as a whole, and a more in-depth glimpse into those who responded for interviews. Despite not being representative of all sub-groups within the community, our findings are still relevant for designing outreach that will benefit those most likely to seek it.

Another potential limitation of this research is that it only reflects the ideas and perspectives of community members in one geographic location. For a more comprehensive analysis of contextual factors that influence goals and preferences, similar studies should be repeated on similar outreach programs in other areas to determine how outreach may need to vary by community, landscape, providers' collaborative dynamics, community members' experiences with wildfire, and other factors.

Finally, because our study did not include a control and intervention group, we are unable to determine whether the strategies and content that were perceived to be the most effective actually directly led to community members' changes in attitudes and behaviors. Our findings are still important in determining preferences for receiving information and identifying likely sources of information that led to changes in attitude or behavior change.

One interesting subset of outreach recipients is land managers for businesses and other organizations in the WUI such as retreat centers. These people often manage the largest parcels of private land, and have to juggle multiple unique considerations: their personal views, their organization's values, and, when applicable, the values of visitors who the organization relies on for business. They are also often not the sole decision-makers on projects, and have to consider how the organization's administration might view forest restoration projects. Because these people manage some of the largest parcels of land in the WUI, and because their organization's mission could potentially reach many people outside of the WUI, future research is needed to evaluate how outreach can be tailored specifically to land managers for businesses in the WUI.

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## APPENDIX A – INTERVIEW GUIDES

### Guide 1 – Providers Initial Interview Guide

#### Background

1. Can you tell me about your professional background?
2. Would you tell me about your position? How long have you been in this role?
3. What are your primary goals in your position?

#### Outreach efforts

4. What efforts have you used to promote forest restoration practices, including prescribed fire, in Northern Colorado?
5. What are the goals for these outreach efforts?
6. Can you tell me a little about how you collaborate with other agencies regarding community outreach efforts?
7. How have you engaged with private landowners and residents? Could you describe the various efforts you've been involved in to engage their interests?
  - a. How often did you initiate contact? How often did the public approach you?
8. How have landowners responded when you've introduced various forest restoration efforts? In what ways were they curious? Resistant? Excited?
  - a. How have landowners responded when you've introduced prescribed fire?
9. Before you talked to them, how did you think landowners would perceive your message? Did your perception change after you talked to them?
10. Were there preconceived notions regarding forest restoration that you had to address in your outreach?
11. Do you think your interactions changed the way they perceived forest restoration? If so, how? What do you think primarily caused the change in perspective?
12. What challenges did you face in your outreach efforts?
  - a. How did your methods evolve in order to address these challenges?
13. What would you say were the most effective methods/approaches when interacting with landowners? The least effective?
14. How do you prefer to deliver your outreach?
15. What surprised you the most in these interactions?
16. Are you aware of any community conversation about this? What can you tell us about it?
17. Following the treatment, have landowners reached out to you to express their reactions or perceptions?
18. Overall, would you say the outreach was effective in meeting your goals?
19. If you were recommending to another district how to engage landowners, what approaches would you recommend? What methods would you discourage?
20. What opportunities do you see for improving future outreach programs about forest restoration such as prescribed fire?
21. Is there anything else you'd like to tell us about or think we should know?
  - a. Do you have anyone you'd recommend we should talk to?



## Guide 2 – Recipients Initial Interview Guide

### Background

1. Would you tell me the history of your land? How/when did you acquire it?
2. Have you seen any type of forest restoration activities on adjacent lands?
  - a. How long ago was this? How did this impact the goals for your land?
3. What are your goals in how you manage your land?
  - a. What management tools do you use or have you adopted?
4. What challenges do you encounter trying to accomplish your goals?
5. How do you see your land fitting into a broader landscape?

### Agency Interactions/Outreach Received

6. What person/people or agency/agencies have you been in contact with about forest restoration?
7. How did you become aware of [agency]'s outreach efforts?
8. Please describe your first interaction with [appropriate agency]? What was it like? What topics were addressed?
9. Ask these questions if prescribed fire is mentioned:
  - a. What is your experience with wildland fire (wildfire or prescribed)?
  - b. How, if at all, has it changed your perspective of using fire as a restoration tool?
  - c. Can you tell me about your interests in prescribed fire?
  - d. Are you aware of any past or future prescribed fire burns being implemented on or near your property? If yes, what was your initial reaction?
10. Ask these questions if prescribed fire is not mentioned:
  - a. Did [provider] talk to you about prescribed fire?
  - b. Have you thought about prescribed fire as a management tool in this area?
  - c. How did you become aware of prescribed fire?
11. What were your ideas or perceptions on these topics prior to the [interaction]?
12. Did your perceptions change after the [interaction]? How?
  - a. Did they do something specific to change your opinion?
  - b. Was there anything you did differently after interacting with the managers?
13. How have benefitted from [provider] outreach efforts?
14. Are you aware of other outreach efforts that you did not take part in?
  - a. Why didn't you participate?
15. Have you talked to other people about these topics?
16. Can you tell us about any community conversation that you're aware of regarding forest restoration? Did other opinions influence yours or vice versa?
17. How did you see your goals or questions being addressed by [provider]?
18. After seeing the results of treatment, would you consider implementing it on your land?
  - a. Why or why not?
19. How has forest restoration outreach and implementation affected your community?
20. What opportunities would you like to see for future outreach programs?
21. How do you prefer to receive forest restoration-related information?
22. Is there anything else you'd like to tell us about or think we should know?
  - a. Do you have anyone you'd recommend we should talk to?

### **Guide 3 – Providers Follow-up Interview Guide**

#### **Experiences with the Elk Fire**

1. Can you tell me a little bit about your experience with the Elk Fire?
2. What was your general/primary role in the burn and the aftermath? What was your role related to communication?
  - a. Has your communication role/interaction with the public changed since the first round of interviews? What was your role before, how has it changed? Have your goals changed? Etc.
  - b. Make sure to touch on: Were they providing information? Directly or indirectly? If indirectly, describe who they were providing info to and what sorts of info.

#### **Outreach and Communication**

1. During the Elk Fire, how did you communicate with folks who may have been affected?
  - a. Probe as needed to find out target audiences, methods used, content
  - b. What were the specific goals you hoped to meet through this communication?
2. What kinds of questions or feedback did you receive throughout this time?
3. In hindsight, what do you think was handled well? What are areas that could have been/could still be improved? Would you change anything?

#### **Moving Forward/Next Steps**

1. At this point, what are your biggest concerns about moving forward with communication?
2. Do you feel that outreach has affected the way the community dealt with the Elk Fire, before, during, and after? How? [NOTE: this is their perception]
3. Did anything surprise you during or after the Elk Fire? Community interactions, expectations, etc...
4. What are next steps for your [agency/organization]?
5. Are there any other thoughts or experiences related to the Elk Fire or outreach that you would like to share?
6. We know that there was ongoing outreach and communication in this area prior to the Elk Fire. How has the outreach program changed since the Elk Fire was contained?
  - a. Try to ask for direct comparisons if they don't give them (how is that the same or different from what you did before?). Touch on the before/after of:
    - i. Methods
    - ii. Content
    - iii. Goals
    - iv. Collaboration – probably don't even need to prompt
  - b. How did the outreach program inform what happened during and after the fire? (can ask this or just probe to touch on it)

## Guide 4 – Recipients Follow-up Interview Guide

### Experiences with the Elk Fire

1. Can you tell me a little bit about your experience with the Elk Fire? How did you become aware of it? How did it impact you personally?
2. What is your perspective of fire as a restoration tool?
3. Did you communicate with your neighbors or other community members during the Elk Fire? If so, what sorts of conversations did you have?

### Outreach and Communication Received

1. Do you remember receiving any information about that particular prescribed fire before it happened? If yes, what kinds of information did you receive and from whom? Did you seek out information?
  - a. [If yes] Did you feel that that was an adequate amount of information to meet your needs?
  - b. [If no] How did you feel about not having received information? What kinds of information would you have liked to have received?
2. Do you feel that the outreach you received before the escape, directly related to this burn, shaped the way that you experienced the Elk Fire?
  - a. What about general outreach before the escape (not specifically relating to this burn)?
3. What kinds of information did you receive during the time the Elk Fire was active? Did you seek out information? From where?
  - a. Follow-ups as needed to identify who sent the information, how it was sent (email, phone, social media, etc), what sorts of content was included
  - b. Follow-up: Did the information you received answer all your questions/meet all your needs? Did it make you feel secure?
4. Are you aware of any community meetings or events that have taken place that aim to address the Elk Fire? If so, have you attended any?
  - a. [If yes] What sorts of information did they cover, and did you feel that it met your needs?
  - b. [If no] Why not? Have you followed up on the escape in other ways?

### Ending

1. What were your thoughts on prescribed fire prior to the Elk Fire?
2. Following the elk fire, how have your views about prescribed fire changed? Have they? If yes, what made them change? If no, why didn't they?
3. Following the Elk Fire, how do you feel about ongoing forest restoration efforts in your community (thinning, prescribed fire)?
  - a. Follow-up: Are these similar to the feelings you had before the escape?
4. Can you tell me about any community conversation that you're aware of regarding the Elk Fire or forest restoration in general?
5. How, if at all, do you think outreach could or should evolve in the aftermath of an event like the Elk Fire?
6. Are there any other thoughts or experiences related to the Elk Fire or outreach that you would like to share?

## APPENDIX B – CODING TREES

### Coding Tree 1 – Initial Interviews

- I. Goals and outcomes
  - a. Overarching goals
    - i. Providers: larger, cross-boundary burns
    - ii. Recipients: fire mitigation, forest health, wildlife, legacy, stewardship
  - b. Goals of outreach program
    - i. Outreach providers goals for program
      - 1. Community understanding/acceptance of forest restoration
      - 2. Encourage landowners to implement projects on private land
    - ii. Recipients goals for seeking information
      - 1. Home/community wildfire protection
      - 2. Funding/implementation assistance for projects
      - 3. Forest health, wildlife
  - c. Providers' outcomes
    - i. Perceived positive response
    - ii. Vocal minority
    - iii. Landowners implementing projects; outreach helped
  - d. Recipients' outcomes
    - i. Feelings of safety, security, more comfortable seeing smoke
    - ii. Several implementing projects
- II. Outreach strategies used
  - a. Providers' strategies for initiating contact with new people
  - b. Providers' strategies for sharing information
  - c. Content used in outreach
  - d. Recipients' evaluations of strategies used
- III. Collaboration and neighbor-to-neighbor sharing
  - a. Collaboration plays major role for outreach providers
    - i. Shared capacity
    - ii. Consistent messaging
    - iii. Filling niche roles
  - b. Neighbors don't communicate much
  - c. Neighbors communicate about wildfire preparedness
    - i. Neighborhood captains
    - ii. Grant funding
- IV. Challenges and barriers
  - a. Providers' challenges
    - i. Limited capacity for outreach program
    - ii. Difficult to reach everyone in target audience(s)
    - iii. Perceive that community doesn't trust government
  - b. Recipients' challenges
    - i. Gathering information solo
    - ii. Perceived mismatch in goals from outreach providers

## **Coding Tree 2 – Follow-up Interviews**

- I. Goals and outcomes
  - a. Providers' goals for outreach program during and after Elk Fire
    - i. Target audience for Elk Fire communication/messaging
      - 1. WUI community members
      - 2. General public/media
    - ii. Transparency/share accurate information
  - b. Types of information sought by recipients
    - i. Fire updates
    - ii. Did not seek information about the Elk Fire
  - c. Providers' outcomes
    - i. Benefits of outreach prior to Elk Fire
      - 1. Community members familiar with USFS outreach techniques
      - 2. Community understanding and personal contacts
    - ii. Mixed perceptions of community response to Elk Fire communications
  - d. Recipients' outcomes
    - i. Still supportive of forest restoration practices
    - ii. Relationships with providers built prior to Elk Fire
    - iii. Moving forward with projects on private lands
- II. Outreach strategies
  - a. Strategies used by providers (social media, events, news, etc)
  - b. Ways recipients gathered information
  - c. Content of outreach
    - i. During the Elk Fire
      - 1. Acknowledging partnerships/"all in this together"
      - 2. Sharing accurate information/transparency
    - ii. After the Elk Fire
      - 1. Ecosystem recovery
      - 2. Technical information about why fire escaped
      - 3. Question and answer
  - d. Providers' recommendations for moving forward
    - i. Increase amount and duration of outreach
    - ii. Strengthen collaboration
    - iii. Use USFS's style of notifications
    - iv. Have template ready in case fire escapes (for quicker response)
- III. Collaboration and neighbor-to-neighbor sharing
  - a. Providers utilizing partnerships
    - i. Multiple entities represented at meetings
    - ii. North 40 Mountain Alliance as bridging organization
  - b. Providers decided on cohesive messaging during and after the Elk Fire
  - c. Neighbor-to-neighbor communication
    - i. Little to no communication with neighbors/other community members
    - ii. Did communicate with neighbors/other community members
      - 1. Updates about the fire
      - 2. Sharing concerns
      - 3. Support/evacuation assistance

- IV. Challenges and barriers
  - a. Providers' challenges and barriers
    - i. Challenges with collaboration
      - 1. Lack of information available to outreach providers
      - 2. Establishing roles
    - ii. Difficulty reaching community during Elk Fire
  - b. Recipients' challenges and barriers
    - i. Recipients had difficulty finding information before and during the fire
    - ii. Information accessibility during/after Elk Fire
      - 1. Phone/internet out while wildfire was active
      - 2. Meetings at bad time/location/not enough advance notice
    - iii. Suggestions to overcome barriers in the future
      - 1. More/different avenues of communication
      - 2. Use maps in notification emails