

Design, implementation, and evaluations of prescribed fire outreach on the Colorado Front Range

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Executive Summary

Study Overview and Approach

Despite a growing emphasis on prescribed burning in the scientific literature and policy, the total US Forest Service (USFS) prescribed fire acreage from 2008 to 2018 increased less than 1% compared to the previous decade (NIFC 2018). The USFS has set goals to improve active stakeholder involvement and education in forest restoration planning and implementation, which typically involves prescribed fire, with special attention paid to those living in the wildland-urban interface (WUI) (USFS 2017). Consistent and effective outreach and communication are important in this context, in light of the 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 prescribed fire projects on the Canyon Lakes Ranger District of the Arapaho-Roosevelt National Forest, where the Magic-Feather Collaborative Forest Restoration Project became a focal point of our study. Several governmental agencies and non-governmental partners were involved in information-delivery surrounding this project. Our study examined the goals of the outreach program, the strategies used to achieve those goals, and the perceived outcomes of the outreach program including challenges and benefits. We examined results in the context of existing outreach and social marketing literature in order to provide recommendations for future outreach efforts in this area and elsewhere.

To achieve our research objectives, our team conducted 23 semi-structured interviews in 2019. We interviewed two main groups: 1) outreach providers, including USFS staff and other agencies and partners who designed and delivered outreach in the study area; and 2) outreach recipients, or community members who received information from outreach initiatives.

Findings

To support the ultimate goal of completing prescribed fire and mechanical thinning projects on a landscape scale, outreach providers designed the program to promote understanding and acceptance of projects near WUI communities and encourage private landowners to conduct work on their own lands. The primary target audiences were landowners in priority landscapes, homeowners within a certain proximity of project areas, residents of mountain communities, and the general public. Outreach activities included project tours, informational home visits to landowners' properties, community meetings, presentations or booths at community events, email to listservs, and social media posts. 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 thought there had been an overall positive community response to outreach.

Collaboration among different land management entities emerged as a key factor in maximizing outreach capacity and completing cross-boundary projects. Many providers wanted to make their information sharing consistent to build credibility in the community. Each outreach provider held a specific role in providing information; for example, some held a stronger role in one-on-one outreach, while others focused more 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, no single strategy for delivering information could reach and resonate with every individual. Additionally, they found it challenging to schedule events around provider and recipient schedules, and to adjust methods based on different communities' preferences. Some providers felt uncomfortable contacting new people. Overall, lack of capacity was the greatest challenge; several participants noted

that their ideal situation would be to hire an individual dedicated to outreach, something that was not feasible for their organization at the time.

Outreach recipients said they had two main learning objectives: gaining an understanding of prescribed fire and thinning practices and securing funding and capacity for work on their own land. When recipients were the ones to initiate contact, they usually started out seeking information about home protection from wildfire. In general, recipients said that they benefited from outreach as it increased their: feelings of safety and security, understanding of prescribed fire and thinning practices, sense of being responsible community members, and ability to share accurate information with others.

Most outreach recipients expressed having very limited communication with their neighbors, often due to part-time residency or a preference for solitude by one or both parties; however, what little communication did take place was often related to wildfire preparedness. Some recipients belonged to a local grassroots organization where they volunteered to share information about fire hazard mitigation and wildfire preparation with neighbors. Others were involved in cross-boundary projects with neighbors.

Both outreach providers and recipients perceived that the most effective outreach platforms were one-on-one communication, home visits, and tours of project areas, especially for developing a base understanding of prescribed fire concepts. Presentations at existing community events also were seen as effective; providers saw them as useful for initiating contact with new people, and recipients found them useful for interacting with providers in the early stages of learning. However, after gaining a basic knowledge of management concepts, many recipients were unsure where to find information about additional learning opportunities or answers to new questions. In later stages of learning, most outreach recipients preferred to receive ongoing communications via one-way email notification listservs. Aside from these listservs and the NextDoor phone application (“app”), which many

community members used to stay informed, unidirectional methods like social media and print handouts were not perceived by providers or recipients to be an effective avenue for meeting outreach goals in this study area.

A few landowners interested in planning prescribed fire or thinning projects expressed a belief that their project goals did not align with the outreach providers’ goals. This was sometimes attributed to the ambiguity of the term “forest restoration,” which outreach providers often used to refer to a broad array of management goals and techniques.

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. While one-on-one outreach and outreach events are overall considered to be the most successful strategies, using such a suite of outreach strategies can help reach the greatest number of people in each target audience and at different phases of learning.

Our findings also support existing literature that personal relationships with recipients and the overall community can be key factors in effective outreach. Creating opportunities for feedback within these relationships may help providers to understand and match the goals of their recipients and might help overcome the challenge of only hearing from the vocal minority.

Additionally, collaboration between land management entities can be useful in avoiding overlapping efforts and reaching broader audiences. Delegating outreach responsibilities across collaborators can help ease the capacity burden and build credibility in the community. 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

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. Thus, a key focus of many restoration efforts is increasing the use of prescribed fire (North et al. 2012; Kalies and Kent 2016).

Despite policy guidance to increase prescribed fire application, the total USFS prescribed fire acreage from 2008 to 2018 increased less than 1% compared to the previous decade (NIFC 2018). A recent study in the West found that most land managers cited implementation capacity, limited incentives, and local conditions as the key barriers to using prescribed fire (Schultz et al. 2018). There remains, however, a common perception that public support for projects is another key factor limiting prescribed fire, especially in the WUI, where citizens are directly affected by prescribed fire (Toman et al. 2006; USFS 2015).

Contrary to the common assumption that the Smokey Bear campaign against wildfire has led the public to reject wildland fire in all forms, 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). A range of factors can contribute to a shift in attitudes or behavior, including perceived risk, trust in the information source, and the ability to undertake an action (self-efficacy) can all contribute to a shift in attitudes or behavior (McDaniel 2014; McCaffrey et al. 2011; White et al. 2019).

Positive attitudes toward projects are just one variable influencing public behavior change. Knowledge, internal and external barriers, and social

norms vary among different target populations, and are all examples of factors that influence decision-making (White et al. 2019; Kusmanoff et al. 2020). For best results, outreach should be tailored to address each of these factors as they relate to each target audience.

Recent studies that have used principles of social marketing and adult education have highlighted the importance of participatory outreach methods that deliver messages in a way that is both relevant and relatable to multiple target audiences (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 (Shindler and Neburka 1997; McCaffrey and Olsen 2012). Outreach providers can facilitate this sharing through discussion groups and outreach events, or by reaching the most highly motivated and influential community members, sometimes referred to as “model landowners” (Niemic 2019). The “stages of change” model of outreach suggests that people utilize different sources and types of information as they progress through different levels of knowledge and readiness to act; however, the overall most effective strategies for effective attitude and behavior change outreach are those that are engaging and participatory (Ardoin et al. 2013; McCaffrey and Olsen 2012).



Research Overview & Approach

The Arapaho and Roosevelt National Forests and Pawnee National Grasslands (ARP) have been working on cross-jurisdictional and collaborative prescribed fire and thinning projects to address forest restoration and fire mitigation goals. As part of outreach initiatives set by the ARP and the USFS as a whole, personnel with the ARP and its partners have prioritized improving active stakeholder involvement and education in project planning and implementation, with special attention paid to those living in the WUI (USFS 2017).

We evaluated outreach that took place on the Canyon Lakes Ranger District of the ARP, where fragmented parcels of private land, and three small WUI communities, are scattered alongside and within the boundary of the Magic-Feather Collaborative Forest Restoration Project. The outreach program consisted of a range of activities provided by several different governmental agencies and non-governmental (NGO) 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 planning 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.

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) Examine results in context of existing outreach and social marketing literature to inform future outreach efforts for this case study and on a broader scale.

To complete this project, the lead author, with support from the team, collected qualitative data in the form of semi-structured interviews, which are designed to facilitate a deeper understanding of intricate underpinnings of human perceptions (Glesne 2011). Our population of interest consisted of two groups: outreach providers and outreach recipients. We defined outreach providers as those who created and dispersed information about prescribed fire and thinning projects; most commonly, this included professionals from local, non-profit, and federal land management entities. Outreach recipients were defined as people who sought or received information about projects; this group consisted of landowners and WUI community members. We developed separate interview guides for each of these two groups. A total of 23 confidential interviews took place from April to October of 2019.

Our initial list of outreach providers included representatives from CPRW, NRCS, and the USFS, all of whom 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 sought 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 entities, 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 or neighborhood association meetings, or had attended open houses and tours. Of these, we contacted 36 people and 15 agreed to participate in an interview, including 10 who identified themselves as landowners. 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 interviewees into two groups with separate interview guides allowed us to understand the perspectives of both the providers and the recipients of outreach. Each interview lasted approximately 45-60 minutes and took place at a location of the participants' choice. Interviews were recorded and then transcribed by a third-party company, Rev.com. Our analysis consisted of a thematic coding process, where we used social science analysis software (Dedoose) to sort segments of the transcribed data into several pre-determined categories based on our research questions and other major categories that arose organically during interviews (i.e. inductive codes). The findings in this report are derived from our analysis of our interview data (i.e., the perceptions of our interview participants).



Findings

1. Outreach Provider Goals

To ease cross-boundary project implementation, providers designed outreach to promote understanding and acceptance of prescribed fire and thinning and encourage landowners to conduct work on their lands. Providers believed that getting to know community members and building acceptance of projects, often referred to as “social license,” would help ease planning associated with the National Environmental Policy Act (NEPA), prevent backlash to projects, and achieve the goal of getting more projects completed. Building credibility, preventing misinformation, and showing positive results from previous projects were emphasized as part of reaching this goal. Providers also encouraged private landowners to conduct projects; this secondary goal was specifically designed to meet cross-boundary burning objectives.

Providers saw collaboration as an important strategy for maximizing the extent and effectiveness of the outreach program. Many providers emphasized the importance of unified messaging; several mentioned the use of standardized language to ensure consistency and to avoid creating a perception of mixed messages. Each entity held a niche role in outreach and implementation, which arose organically as the collaborative effort developed. Outreach providers told us that this helped them share outreach capacity and avoid overlapping efforts.



Different outreach providers offered different services to the community, and through the collaborative effort they felt they could offer a “package” for landowners to choose what services to utilize:

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)

2. Target Audiences, Outreach Channels, and Informational Content

To promote acceptance of projects and encourage prescribed fire and thinning on private lands, providers targeted two primary groups: 1) those who would be most directly affected by a project, and 2), landowners in “priority” treatment areas. Outreach providers generally tried to reach community members within a one to three-mile radius of a given project in order to promote an accepting attitude toward prescribed fire and thinning activities. To encourage changes in behavior (e.g., landowners conducting projects on their private land), providers targeted landowners within “priority areas,” who were selected based on their property's location, size, accessibility, or watershed value. Most forms of outreach were open to the general public but geared toward residents in WUI communities near upcoming land management projects.

Outreach providers utilized a number of channels to initiate contact with new people and deliver information (Table 1). Events generally consisted of project tours, community meetings, open houses, and presentations at community

Table 1. List of strategies utilized by outreach providers to initiate contact with new people and to share information.

Outreach Providers' Strategies	Description of Strategy
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 projects.
Presentations	One or more outreach providers speaking to an audience about prescribed fire and/or thinning, 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 a presentation on these topics.
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 projects were 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.

events. One-on-one outreach included personal email or phone communication, home visits, and occasional door-to-door outreach. Providers also hoped that by doing more visible projects, community members would see positive results and seek further information, or even seek capacity to conduct projects on their own lands. Unidirectional outreach, or one-way information delivery, included social media, news releases, listservs, posting on the NextDoor app, publications, and flyers/brochures.

Providers often tailored outreach content to specific goals, but almost always covered “big picture” topics like the purpose of prescribed fire, the planning process, and phases of recovery. 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 “experts,” like researchers or firefighters, to share this information and address what they perceived to be common misperceptions about the planning and implementation process. One outreach provider, quoted below, said they emphasized these topics in order to address common misconceptions about the USFS’s planning process.

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 providers did not always agree on the best way to frame their information. Some providers felt that using imagery of destruction from wildfire was the best way to spark the community’s attention, while others disagreed. The following quotes illustrate these differing perspectives:

Overall, what [do I think] 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)

3. Outreach Recipient Goals

Initially, most recipients were interested in learning about how to protect their home or community from future wildfire, often due to a high sense of risk following the High Park Fire, which burned more than 87,000 acres nearby in 2012. Other times, recipients 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. In many cases, in the process of learning about ways to prepare for wildfire, recipients became more interested in information about broader forest restoration efforts.



Landowners who developed an interest in planning projects on their own properties often were ill-equipped to do the work themselves and became interested in learning about capacity-building opportunities. Most commonly, they sought assistance in identifying grant opportunities, creating successful grant applications, and contracting manual labor.

Outreach recipients often shared wildfire preparedness information and learning opportunities with fellow community members and received mixed responses. 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; what little communication did take place was often related to wildfire preparedness. There were several instances of neighbors sharing information, including: a participant that gave contact information for an outreach provider; people sharing information about tours or inviting neighbors to attend; and local clubs or organizations giving contact information for other groups for outreach providers to target.

4. Interviewees' Perceptions of Outreach Strategies Used

4.1 Evaluations of Channels Used to Deliver Information

Outreach recipients valued opportunities that allowed them to hear from “expert” speakers such as researchers, foresters, and wildland firefighters. Recipients considered such sources to be especially useful for building understanding and acceptance of projects.

Both outreach recipients and providers thought that visual examples, such as photographs or tours of projects, were useful strategies, especially for landowners who were considering planning projects. Recipients cited seeing historical photographs and illustrations of the sequential steps of project planning, implementation, and recovery as being particularly useful in building their understanding of how projects are designed to meet various ecosystem health, wildlife, and fire mitigation goals.



Several landowners stated that they would not have conducted work without first touring positive examples in their area. The experience enabled them to better identify ways they could adjust their projects to fit their needs. For example, one person did not like the appearance of burn piles during a tour and opted to have the debris removed manually from their property instead; another decided to include thinning work in their project after seeing how “natural” it could look.

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. (Outreach Recipient)

With the exception of the NextDoor app, neither outreach providers nor recipients thought unidirectional outreach, including brochures, was 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. They noted that it was a good way to spread information about tours and other community events. Below, an outreach recipient explains that they found attending a tour to be much more engaging than reading a brochure.

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)

After gaining a basic knowledge of prescribed fire and thinning practices in their area, most outreach recipients preferred to receive ongoing communications via email. Many participants wanted one-on-one communication at first, but, once they got their questions answered and felt comfortable with the projects happening in their area, they preferred to get notification-style communication via email. Additionally, landowners planning projects on their land generally preferred intermittent communication with providers to take place over email.

Although many providers and recipients perceived that the overall community preferred non-governmental partners over government agencies, no one in our sample personally held this preference. Only one outreach recipient we interviewed expressed a mistrust in any government agency. Many providers, and a few recipients, felt that collaborative partners supported the USFS by facilitating outreach events and spreading a consistent message.



4.2 Evaluations of Outreach Content

Both outreach providers and recipients said personal communication and relationships were the most effective ways to achieve their respective goals. Outreach recipients commonly noted providers' ability to answer questions as a useful aspect of personal communication. Most 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.

Both providers and recipients mentioned the importance of following up, maintaining flexibility, and not "preaching" information. When asked what they recommend for outreach, two of the most common responses from outreach providers were for providers to be patient and to understand the target person or audience'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.

Landowners planning projects particularly valued having personal communication with providers and receiving information to improve their efficacy for project completion (e.g. funding opportunities and logistical assistance). Funding opportunities, completing forest inventories, offering information about which providers offer what resources, and providing details on how landowners can complete work on their own are all examples of capacity-building and logistical assistance that landowners found useful.

Most of the outreach recipients who had already completed or were planning projects on private land said they would not have had the capacity to do so without grant funding. Many participants said that receiving grants, and even getting help finding and applying for grants were some of the greatest benefits of outreach. Interactive communication and personal relationships with

outreach providers were considered especially important when speaking with landowners who were considering planning prescribed fire or thinning projects. Providers felt that, through this one-on-one contact, they earned credibility. Meanwhile, recipients appreciated having a reliable expert on hand for specific questions about their property, as expressed in the quote below.

And then getting to meet with [the outreach provider], 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)

5. Perceived Outcomes

The paragraphs below describe how providers and recipients perceived the outcomes of the outreach program, in the context of providers' original goals.

5.1 Goal #1: Promote understanding and acceptance of prescribed fire and mechanical thinning objectives

Almost every outreach provider we interviewed perceived an overall positive community response to outreach and projects. Though several expressed difficulties with a perceived vocal minority of unsupportive people, all providers concluded that responses to their outreach were mostly positive. Below, one provider expresses their surprise with the positive response.

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 expressed beliefs that their outreach had changed peoples' perceptions, that they successfully built trust in the community, and had helped people to conduct work on their private lands. Several outreach providers perceived that presenting success stories and reaching the most active landowners had created a positive ripple effect in the community. In the following quote, an outreach provider expresses why they perceived outreach to be important.

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)

Outreach recipients said they felt safer in their community knowing that projects in the area could help to mitigate future wildfires. Landowners who completed projects on their land expressed that they felt safer should a wildfire come through. While recognizing that there was no guarantee that any home would withstand a large wildfire, many seemed satisfied that their home would at least be "defensible." Other recipients who either did not own land or had not done projects expressed that they felt safer simply knowing projects were happening in the area. Several mentioned that, because they now understood the wildfire mitigation components of prescribed fire and thinning projects and were kept up to date on current prescribed fire projects, they no longer felt scared when they saw smoke near their home. In the following quote, an outreach recipient explains that they felt safer knowing the precautions taken before a prescribed burn.

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: Encourage prescribed fire and thinning projects on private lands

Landowners who wanted to complete prescribed fire or thinning projects on their private lands saw receiving information about and assistance applying for grants as some of the greatest benefits of outreach. Lack of capacity (money, labor, time, and experience) was the greatest challenge outreach recipients faced in completing projects. Because grants were more likely to be awarded to larger parcels of land, several landowners applied for grants together or joined the same contract for projects.

Many recipients saw knowledge and understanding as benefits in themselves. 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.

Though not initially identified as a goal, many recipients said they benefitted from the opportunity to exercise responsibility as a neighbor or community member. Additionally, recipients often felt that they were better neighbors when they shared accurate information with others in the community, and when they completed prescribed fire or thinning projects on their lands that could help mitigate future wildfires. Several accepted leadership roles sharing wildfire preparedness information with their neighbors, and a few enthusiastic individuals said that they planned to allow tours on their property to showcase their projects.

The quotes below illustrate recipients' willingness to share the information they learned from providers.

There was a gentleman who called who said, "My friends told me there's smoke in Red Feather Lakes. What's that 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] has 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 said they were unable to reach everyone in the target audience. Several expressed a perception that a minority of community members who had negative preconceived notions about projects would never be open to receiving information. Others noted that access could be an issue for some people due to limited phone or internet access or part-time residency. Part-time residents were not always in the area, and providers speculated that second homeowners may be less invested in home protection than full-time residents. These issues are highlighted in providers' quotes below.

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)

Providers addressed this challenge by utilizing a broad range of information channels; however, they wanted to avoid overlapping efforts with other providers. One provider said that they had to "get creative" in outreach, using road signs, setting up a pre-recorded phone line, and providing business cards to crew members to share with community members. One provider perceived that mailing information seemed to reach a broader audience than other efforts could. On the other hand, one outreach provider expressed the importance of open communication with other entities to ensure they were not duplicating work or repeating information to people who had already received it.



Some outreach providers felt uncomfortable initiating contact with new people, particularly when information was gathered through county records. Despite their personal discomfort, demonstrated in the quote below, in most cases outreach providers thought 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. (Outreach Provider)

Several providers cited a capacity as a key outreach challenge, currently and looking toward the future. The most common capacity issues were a lack of time and money for a thorough outreach program. Several providers 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 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 or personal schedules, as well as 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 became important to keep track of differences in each community's perceived preferences for outreach content and delivery. Managing relationships on a community-by-community basis became even more difficult in larger communities, where there were many sub-communities. 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 seemed 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 said that most of the feedback they received was negative; however, most ultimately agreed that this was a small, vocal minority of the overall population. Despite the common perception that most feedback was negative, nearly every outreach provider agreed that these negative responses were mostly outspoken outliers. Below, an outreach provider expresses their experience with people who do not support the federal government.

If you're a federal employee long enough, you develop a healthy understanding that there's a wide range of opinions about [the federal government]. ... 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)

Several outreach recipients perceived a mismatch in goals with outreach providers, oftentimes due to varying interpretations of providers' language. “Forest restoration” is defined in a 2018 USFS report as, “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). Outreach providers often used this term to refer to prescribed fire and thinning projects in the area; however, landowners who were unfamiliar with the term “forest restoration” sometimes interpreted it to simply mean “restoring the forest” to a more natural or historical state. The quote below illustrates that those who were interested in other goals, such as wildfire mitigation or wildlife habitat, did not always 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)

In other cases, the information provided was not calibrated correctly to individual preferences. For example, one outreach recipient said that when an outreach provider visited his property, he received lots of “big picture” information, but he wanted to hear more about his individual parcel of land. This could have been an easy fix; however, the outreach provider likely did not know that was an issue.

Sometimes, as a result of a perceived goal mismatch, some landowners faced a challenge in feeling that they did not have enough say in project planning on their land. Flexibility was a concern for several landowners, with some hesitant to plan projects out of concern that they would not have enough say in the process. Some wanted to

maintain a certain number of trees for aesthetics or privacy during the thinning process but felt that they were not given that option. For example, the outreach recipient quoted above chose to cancel their thinning project due to a perceived mismatch in goals with providers; they later found a different land management entity who they felt offered more flexibility in project planning.

One consistent challenge across recipients was a 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. If they had minor questions, they did not know where to find reliable information that was applicable to their region. Quoted below, one outreach recipient relied on existing contacts to keep them up to date on new information and projects.

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)

Outreach providers felt that they most often initiated contact; however, several outreach recipients we interviewed said that they were the ones who initiated contact. In an effort to communicate with as many community members as possible, outreach providers used a variety of different outreach strategies (Table 1). For this reason, they perceived that they were most often the ones initiating contact. Several outreach providers noted that a few community members had begun to initiate contact, and we spoke with several outreach recipients who confirmed this. In one case, a landowner expressed frustration that they had to initiate contact first, noting a belief that they had been left out of the target audience.

Conclusions

Public acceptance of projects is often perceived to be a crucial factor in on-the-ground project implementation; landowner engagement is seen as particularly important for completing cross-jurisdictional projects. For these reasons, it is important to understand how to design and carry out an outreach program that resonates with a target community. This case study examined the goals of one outreach program and analyzed various strategies' effectiveness in achieving those goals from the perspectives of both providers and recipients of outreach. This study is limited in scope to a specific geographic region and situational context. However, our findings suggest a number of potential solutions to common outreach that are supported by concepts from communications and education literature. These can act as a reference for future outreach programs and research projects that seek to apply similar concepts to a prescribed fire program.

Most of our interview participants, both providers and recipients of outreach, perceived the outreach program to be successful. Overall, 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. Outreach providers and recipients alike perceived that the outreach program led to greater public support of projects and successfully encouraged several landowners to take action on their lands. Outreach recipients felt safer in their community once they had their questions answered by reliable experts and understood how prescribed fire and thinning could contribute to wildfire mitigation. Most providers and recipients agreed that interactive communication and personal relationships were the most effective strategies for garnering public support and understanding.

Coordination and collaboration among outreach providers may help to leverage capacity, diversify information messengers, and ensure

consistent 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 completing cross-boundary projects.

Using a suite of outreach methods and an incremental approach to content can help reach the greatest number of people with different interests and at different phases of learning (Monroe et al. 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 interactive events were overall considered to be the most successful, supplemental materials can be useful to grab people's initial attention, reach part-time residents and residents who are not as involved in the community, or follow up with people who no longer require in-depth communication.

Providing resources for ongoing, independent learning may help recipients continue engaging after their initial phases of learning. A common challenge for outreach recipients was conducting independent research after gaining an initial understanding of the concepts. To address this challenge in the later learning stages, outreach providers may want to focus on sending consistent notifications about ongoing projects and providing outreach recipients with reliable resources they can access on their own.

Providing opportunities for feedback can help providers identify sub-groups within the community and tailor information content and channels to each group's unique needs, goals, and preferences (Kusmanoff et al. 2020). This could potentially help address two of outreach providers' common perceptions: that they cannot reach everyone in the target audience and that certain members of the target audience disapprove of the government. Audience segmentation, the process of systematically splitting the community into distinct sub-groups based on relevant

demographics or personality traits, can help to identify whether different sub-groups prefer one type of organization over the other; for example, if a specific subset of the community commonly disapproves of the federal government, outreach to that audience can include stronger representation from local or non-profit entities.

While understanding the community as a whole is important, building personal relationships is also a key foundation of effective outreach.

Many outreach recipients, particularly those who chose to complete projects on their private land, referred to their primary outreach provider by their first name. Recipient feedback can be useful on an individual level for improving the effectiveness of strategies like home visits.

Although some outreach providers chose to frame projects using fear-based imagery of high-profile wildfires, there is no evidence in the

literature of a linear connection between fear and behavior change. Conservation literature cautions that fear-based messages should be used carefully, 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; Monroe et al. 2006).

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 completed any work without such assistance, and some cited this as the most beneficial part of their interactions with agency personnel.



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