FY03
PROGRESS REPORT

Toward Understanding Public-Professional Communication about Wildland Fire and Fuels Management in Colorado's Front Range

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Executive Summary

Public-Professional Understandings of Fuels Management

The research question addressed in the progress report asked how public understandings of fuels management compare to those of professional experts. We have summarized our observations and analysis of group interviews into five themes to address this question.

Theme I: Increased awareness without self-organized action

Some professional groups that we interviewed recognize that public awareness is high and wildfire and fuels have become salient issues in the Front Range. Professionals do not understand why increased awareness has not translated into more action on-the-ground to implement fuels reduction projects.

- *Changing attitudes and behaviors* by educating and dispersing information remains a prevalent mind-set, but by itself this strategic definition of the problem is inadequate for building the capacity in interface communities that is necessary to organize, fund, and start fuels reduction projects.

Some residents said that they had changed to metal roofs in years past—they have Fire Wise and defensible space information and can readily repeat it, but often seemed to lack the organization to get projects funded and underway. Residents in the interface often know what to do and why but not how to take action.

A barrier to successful mobilization was identified for large-scale fuels reduction projects that require self-organization.

- Mitigation requires decision-making and action by a single like-minded entity, but all the different people who own the trees across the landscape can't come to an agreement. This highlights the need for substantial amounts of time for communities to develop relationships and self-organization.

- The barrier to collaboration is that some interface residents often are interested in being alone in the forest, and they are not *yet* trusting of collaboration and group mobilization.

A community's ability to mitigate wildfire risks does not depend on how much information they have received or for how long they have been exposed. The readiness of a community to mobilize and begin fuel reduction projects may often depend on how long they have been talking about the issue between themselves and outside partners.

- **IMPLICATION**: Across the Front Range, interface communities are at different levels of self-organization. One of the first steps for professionals and citizens working on community-level fuels reduction projects is to identify a community's level of self-organization and readiness to mobilize. Have they begun to establish relationships of trust or not?

Theme II: Differences of scale

Different definitions of the scale of the wildfire and fuels management issue emerged for professional and public stakeholders.

- Wildfire and fuels management in Colorado's Front Range has been framed by some professionals as a *landscape level problem* requiring a *cultural shift* in thinking about forest conditions *over the long-term*.

Residents of Front Range interface communities that we spoke to are aware of local threats from wildfire. Large portions of conversations between residents focus on public safety and evacuation during fire events. Interface residents are concerned with the local situation and not necessarily the broad region of the Front Range.

- Interface residents told stories of wildfires, interface house fires, and evacuations that they had experienced. An *evacuation-suppression-public safety* mind-set was evident in the dialog, including how to evacuate livestock and pets and what to do about neighbors who are not home during a fire. Residents spoke of organizing phone trees to facilitate evacuations. Communications during a fire and getting up-to-date information about the status of the fire are important.

Some residents are aware of broader ways of thinking about the problem in terms of forest health. Some residents recognize that landscape restoration would entail an effort beyond individual homeowners and communities.

- One barrier is that there are not enough community-level forestry professionals available to engage and help organize the many communities in the region.

IMPLICATION: Professionals and publics need to continue to seriously discuss and perhaps come to some level of consensus over what is actually at risk. Are Front Range interface *communities* at risk from wildfire or is *the region* of the Front Range at risk?

Theme III: What does forest health mean for fuels reduction?

We interviewed conservation groups and agency foresters concerned with forest conditions. Some professional ecologists and project managers that we interviewed think that the fuels issue in the Front Range provides an opportunity to get people talking about conservation. The interface fire issue "requires agencies to work together and to communicate like they never have before." The Front Range Fuels Treatment Partnership (FRFTP) facilitates cross-boundary relationship building.

- But does a view of wildfire in the interface as a catalyst for conservation imply a *forest health and restoration definition* of the problem? Some agency professionals and some conservation-minded NGO professionals define the issue in terms of long-term forest health and restoration of fire dependent ecosystems.

- Under a forest health definition, success might be defined as the longevity of "healthy Front Range forest conditions" and high levels of biodiversity. The problem with these criteria for success is that they have multiple and changing definitions on which publics and professionals do not consistently agree.

Landscape-level approaches to fuels reduction may resonate with some residents who own large expanses in the interface. Perhaps some large landowners who are interested in improving habitat for preferred wildlife and who are intimately familiar with large tracts of land because of heritages in agriculture or forestry, share professional definitions of the issue such as improving optimal, viable, or "healthy" forest conditions.

Interface residents that we interviewed were small landowners and tended not to frame the issue in terms of forest health and landscape restoration. We recorded residents discussing local issues of safety and homeowner assistance. But other small property owners in the Front Range may be interested in restoring wildlife habit in and around their communities, for example, and therefore may think in terms similar to professional definitions of forest health in addition to public safety and defensible space.

- Both forest conditions and community protection are important to the mission of the FRFTP, but professional and public understandings often do not match regarding the relationship between restoring "healthy" conditions and reducing fuels for community protection.

IMPLICATION: Project-level professionals and citizens need to clarify where, when, and how different ways of understanding forest health and restoration can be productively integrated into fuels reduction projects. Perhaps for some large land owners and for large tracts of uninhabited public forest discussing forest conditions makes sense. However, in interface communities comprised of small properties, it makes more sense to discuss "healthy" community conditions such as feeling both safe and emotionally connected with place and life in a *wildland-human environment*.

Theme IV: Can the Front Range population coexist with wildfire?

A major aspect of the forest health frame of reference is restoring fire. Land managers would increase the use of fire as a tool, and naturally occurring wildfires that do not threaten people would be allowed to burn more often than under the strict suppression policies of the past. But some professionals involved with the issue in the Front Range are asking whether or not it is realistically feasible.

- It is highly uncertain whether people understand what coexisting with wildfire and increased levels of prescribe burning might entail.

Collaborative partnerships comprised of both private citizens and natural resource professionals were interviewed. Members discussed the relationships between renewable wood fuels, forest health, and restoration of fire dependent ecosystems, but they were not completely in agreement about how these translate into healthy forests.

Professionals working on interface fuels, including many agency and NGO representatives we interviewed, acknowledge that all forests in the Front Range are not equal regarding fire frequency and intensity—thereby suggesting limitations to applying simplified standard approaches to reduce fuels across the region.

Public and professional understandings of coexisting with fire in a fire dependent ecosystem are confused when the relationship between wildfire and forest conditions is communicated in simplified messages.

- Transferring principles of wildfire learned from studying the Ponderosa pine forests of the southwestern United States to the entire Colorado Front Range presents a barrier to understanding the relationship between fuels reduction and forest conditions.

- The Front Range is ecologically and socially diverse and the outcomes of fuels management are often uncertain. Using simple and standardized messages about solutions for the interface fire and fuels problem is inappropriate. Fuels reduction projects designed for the northern Front Range counties may differ substantially from projects designed in the southern part of the region.

IMPLICATION: When discussing forest conditions with specific communities or different publics in the Front Range, professionals working in public relations should be clear with people that the forests of the Front Range are characterized by different conditions, vegetation types, and fire regimes. The one consistency that is important to communicate is that forests in this region tend to burn and that will most likely continue.

Theme V: Building relationships case-by-case over time

Examples of productive relationship building between professionals and publics were often described by project-level workers. Participants talked about regular communication and trust building. Together professionals and publics consider local desires, goals, values, economies, and local land and fire management issues. Then, these can be incorporated into mitigation projects.

This approach to collaboration is described by interview participants as long-term. Project level workers from both agencies and NGOs discussed their success stories in terms of attending homeowner's meetings every other weekend for several years.

- Today, most natural resource professionals are stationed in a central location making regular on-the-ground interaction difficult and expensive. How can professionals and publics working toward mutual understandings of fuels management in the interface build relationships of trust more efficiently?

Short of dispatching live-in researchers and extension agents similar to anthropologists who do years of participant observation in communities, professionals can target the relationships that already exist in the interface communities. To facilitate relationship building, trust, and credibility, projects workers and wildfire mitigation experts can identify and harness the leaders and the groups that are presently organized.

Regular contact, interaction, and a presence of credibility are necessary in interface communities over the long-term to establish relationships. Collaboration is more effective if most of the trusted people at the discussion table live in or close to the community.

- Collaborative partnerships and coalitions are valuable for relationship building and to establish credibility for fuels reduction projects especially when some of the partners actually reside or are respected leaders in the communities.

- Partnerships and coalitions must bring their established relationships of trust and human resources to the discussion tables in local communities in order to be successful. Liaisons exist in citizen's coalitions and partnerships and can provide critical links between professional and public understandings.

IMPLICATION: Professional-public partnerships must enhance their abilities to identify and include more interface residents and community leaders in their discussions about reducing the risks of destructive wildfires in the Front Range. Those who live with fuels build up in fire-prone areas are valuable partners in that they can adapt what they learn from higher-level collaboration with professionals to fit projects in their home communities. In this way, *inclusiveness facilitates the process* of public acceptance and mobilization on-the-ground.

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As geographers have noted for years, the cultural landscape defines the physical landscape and must be taken seriously in pursuing sustainable landscape management.
Charles C. Geisler, 2000

Introduction

Problem Description

It is evident today—although admittedly, not well understood—that the wildfire issue embodies an array of competing social values, multiple stakeholder interests, and uncertain management outcomes. To complicate matters, an appreciation of forests and other wildlands and the steady growth of economic prosperity since the middle of the last century have combined to draw more people into western forests, both to recreate and to build homes (Chase, 1993; Davis, 1990). Large numbers of people now inhabit many places where wildfires were historically common, and where today, large, high-intensity destructive fires are occurring in many interface forests that were historically prone to fires of low intensity, as in the case of some low elevation ponderosa pine forests.

The situation is exacerbated by accumulations of fuels and droughty conditions. For example, Colorado's largest wildfire in history, the Hayman Fire of 2002, occurred in an area with high levels of dry vegetation resulting from a mix of fire exclusion and several years of drought (Russell, 2003). The potential for loss of life and property is not decreasing. The National Academy of Public Administration (2004) reported that interface communities are developing faster than they are creating defensible space and faster than their local governments' capacities to regulate fire-safe development. A more complete understanding of the interface fire problem for all affected people is needed to guide new policies that reflect and integrate social, economic, and ecological needs across agency, public-private, and landscape boundaries (Dombeck and others, 2004). Together people, fuels, and wildfire present new challenges for professionals and publics working in environmental management in Colorado's Front Range.

Open two-way communication is required to formulate the policies that are needed to meet the needs of agency managers, local officials, and interface residents in their efforts to collectively manage hazardous fuels. One barrier to productive communication among numerous parties is that people hold multiple definitions of the interface, the wildfires occurring there, and fuels management. This report is organized around different ways of defining the interface fire problem. We suggest that a discussion of the issue from multiple angles, or perspectives, is appropriate to facilitate the mutual understanding required to formulate new policies in the face of a general lack of information about the outcomes of fuels management in the interface (Bormann and Kiester, 2004).

Study Purpose

Results and implications of this administrative study, once organized and integrated with the literature, are intended to meaningfully guide the Front Range Fuels Treatment Partnership[1] (FRFTP) during implementation of their long-term mission to reduce hazardous fuels in eastern Colorado—an ongoing process of interaction and two-way communication between stakeholders. The specific objectives are to (1) *understand* the

nuances, ambiguities, and consistencies of the interface fire problem through review and study of recently published research and management articles, agency reports, and other documents and (2) formulate *recommendations for improving communication and collaboration* based on interviews collected from key stakeholders. The interview participants belong to professional and public groups working toward fuels reduction in Colorado's Front Range. As a case study, we focused on groups that are involved with the development and ongoing efforts of the FRFTP as collaborators in the wildland-urban interface[2] (WUI). An umbrella objective is to (3) *describe the engaged stakeholders* and how they define wildfire preparedness, outreach, and fuels management.

Guiding Research Questions

The document review and the interviews for the comprehensive study were guided by the following questions: (1) how public understandings of fuels management compare to those of professional experts, (2) what kinds of interactions and communications between stakeholders enable collective fuels management, (3) what are the roles of media and the sciences in understanding interface fuels management, (4) what are appropriate ways to meet education needs in Front Range communities given multiple definitions of fuels management, (5) how can we best understand alternative, and often competing, frames of reference—different ways of looking at the problem, and (6) what are the barriers to and facilitators of communication, community engagement, and capacity building?

Focus of Current Report

- In this research progress report, we focus on question 1—how public understandings of fuels management compare to those of professional experts?
- Question 5 deals with multiple frames of reference and is explored as a sub-theme of question 1 in the literature review and discussion of findings herein.

Work Still in Progress

- An annotated reading list is being developed to provide more details from key studies of social aspects of wildfire and fuels management in the interface. This document will be available in February 2005.
- Research questions 2, 3, 4, and 6 will be addressed in the final comprehensive project report. This document will be available in March 2005.
- We are interested in discussing opportunities with the FRFTP for incorporating our study findings and insights into their existing web site to facilitate interactive learning for professionals and interface residents working on-the-ground.

Guiding Research Assumptions

Cultural definitions of land drive land use planning and management (Geisler, 2000). We assume that what people come know, accept, and eventually do about interface fuels

management depends on their community relations and abilities to communicate with one another and with outside associations. People's cultural ties to land, their ways of seeing local problems, and their abilities to discuss and organize fuels projects hold more weight at the local level than public attitudes toward and broad support for fuels management strategies. The relationships between residents and between their community and the local and regional administrations represent a community's organization, abilities, and social resources on which managing the interface environment depends.

In addition to improving social and ecological knowledge and media and public information campaigns, professionals and publics need *local* interactive exchanges to facilitate reflective thinking and thoughtful give-and-take dialog to sort out the ambiguities surrounding fuels management in the interface (Shindler and Brunson, 1999; Yankelovich, 1991). Mutual understanding can be enhanced by discussing how to think about, define or frame, and reframe the problem. Then, local groups working together under a legitimate definition of the problem that was mutually derived can identify alternative actions that match local views and needs. Additionally, they can meaningfully consider the implications of alternative management actions in their communities.

Ways of Defining the Issue Found in the Literature

Changing Attitudes and Behaviors

Documenting *what* the public understands—in a psychological sense—about wildfire and fuels reduction policies has largely been addressed in social science studies of public opinion. Similar to voting, this research tells us what percentage of the public agrees and disagrees about what is acceptable wildfire and fuels management. This tradition has brought to the fore the critical role of social and political information for wildfire management and decision-making. Since the 1988 western fire season that included the high-profile Yellowstone National Park fires, foresters and wildfire managers have come to realize that "modern forestry is heavily involved in educating and communicating with the public" (Manfredo and others, 1990, p. 23).

- Attention to public attitudes by researchers and forest managers has crystallized the realization that people are indeed part of forest systems, including wildfire and its management.

Attitude studies have informed education and research programs that view people as rational and mechanical consumers of information. Education is generally designed to increase knowledge and acceptance of controversial wildfire policies (Carpenter and colleagues, 1986; Loomis and others, 2001; Neilsen and Buchanan, 1986). In other words, attitude research has underlying assumptions about persuading people to change their views and actions to bring them in line with public policy (Bright and others, 1993; Absher and Bright, 2004, Manfredo, 1992). These assumptions generally reflect linear models of behavior in which attitudes toward supporting an issue, such as fuels mitigation, are thought to directly determine how people intend to behave in the future in response to the fire and fuels problem. Using these models, educators attempt to

influence behavior by altering beliefs, attitudes, and ultimately intentions to act by providing information to the public in the form of verbal messages that contain specific arguments targeting the consequences of supporting the policy (Bright and others, 1993).

However, there are times when attitudes do not translate into behaviors (Brunson, 1996; Manfredo, 1992). Attitudes are one of many factors that affect behaviors regarding fuels mitigation. People's beliefs about what their family and friends think they should do regarding fuels mitigation can also affect behavior. Knowledge, past experience, and emotions associated with fuel reductions affect compliance with policies. For controversial issues, attitudes often are highly polarized, which hampers the efforts of managers to satisfy the preferences of most citizens (Manfredo and others, 1990).

- Communication intended to increase knowledge and acceptance of a fuel reduction policy generally will not succeed for WUI residents who have extensive knowledge and experience with wildfire and fuels mitigation, especially if they are emotionally opposed to the policy.

- On the other hand, these efforts are met with more success with people having little or no knowledge or expertise (Roggenbuck, 1992) and initially positive attitudes toward supporting the policy (Bright and others, 1993).

Communicating with publics by transmitting information alone tends to overlook the context and ambiguity characteristic of natural resource-based social problems. To account for context, researchers have examined factors that influence acceptability and support. Certain situational factors such as how the fire started, potential for damage to private property, risk to wildlife, method of fuel reduction, knowledge of fire, and geographic location have been shown to affect public acceptance of wildfire policies and management (Brunson and Shindler, 2004; Carpenter and colleagues, 1986; Gardner and others, 1985; Kneeshaw and others, 2004). There is growing evidence that managers should consider local situations and priorities case-by-case.

- Wildfire and fuels management in the WUI requires a model of communication that goes beyond providing information to the public because the messages sent often are not received as intended after being filtered through different frames of reference or biases (Weber and Word, 2001).

What does Living with Risks in the Interface Mean?

People move to the interface to experience living close to nature and to improve quality of life. However, nature and quality of life both mean different things to people living in different places at different times. After living in the WUI for some time, newcomers may eventually experience wildfires—the role, dynamics, and management of which are often foreign to their imported views of nature and community life that primarily developed while living in more urban and suburban settings. Until a child or a pet is killed or injured by a wild animal, a week of work is lost due to heavy snows, or a home

or neighborhood burns in a wildfire, the realities of living in the interface may remain unclear and devoid of personal meaning for some residents.

Interface communities are not necessarily cohesive units that share common lines of communication and forest values (Lee, 1991). Experience with wildfire, forestry, or farming and time spent living in the interface can affect people's knowledge, preparedness, and wildfire risk perceptions in positive ways (McGee and Russell, 2003). On the other hand, research in natural hazards indicates that experience with wildfire does not consistently increase risk perception and mitigation activity (McCaffrey, 2004). The multitude of ways in which interface residents within and across communities actively respond to wildfire events, fire and fuels management, and landscape recovery programs after fires can vary dramatically depending on their history in the place and their familiarity with wildfire and forest management (Mendez and others, 2003).

- The multiple dimensions and social impacts of wildfire in the interface are just as important for study as the ecological complexities of the wildfires (Kumagai and others, 2004).

Human settlement in wildfire-prone areas presents a complicated dilemma because wildfire is physically real and dangerous to human life and property, but interface residents' knowledge of wildfire varies and their understandings of the risks exist in the context of individual and peer-group meanings that become more complicated with rising settlement. Risk assessment is complex and involves many disciplines. Slovic (1999, p. 699) argued that the danger from natural hazards is real, but the *risks* are socially defined—"risk assessment is inherently subjective and represents a blending of science and judgment with important psychological, social, cultural, and political factors."

- Many people living in the WUI may be overly optimistic about the inherent risks, and although access to information is important to increase awareness, being exposed to wildfire risk information does not always increase risk perception and preparedness for potentially destructive wildfires (Kumagai and others, 2004; McCaffrey, 2004).

Building Capacities for Fuels Reduction

Residents of western Colorado who reported that they do mitigate their WUI properties described others who do not mitigate as apathetic and irresponsible, uninformed, or simply as having a low perception of wildfire risk (Burns and others, 2003). This description most likely oversimplifies why some communities and individuals fail to reduce fuels and maintain defensible space. Fuels mitigation behaviors depend on various motives, means, opportunities, and capacities (Smith and Rebori, 2001). According to Jakes and others (2003), community preparedness for wildfire is based in a community's networks, leadership, and abilities to mobilize resources (social capital), education and skills of individual community members, (human capital), and a community's collective knowledge of and experience with fire, fuels management, and fire history in the place (cultural capital).

- Defining the issue as one of community capacity, and not problems of risk and public safety alone, focuses on the relationships, abilities, and resources of communities that are required to organize and implement fuel reductions.

Burns and his colleagues (2003) reported that community members in western Colorado often do not agree on who is responsible for taking the lead on wildfire concerns such as fuels mitigation in interface zones. Research on home ignitability suggests that interface homeowners should take primary responsibility to reduce the risk of loss by taking actions such as installing metal roofing and maintaining defensible space to ensure low levels of ignitability for their houses and immediate surrounding areas (Cohen, 2000). Agency wildfire managers, state and local government officials, and local fire departments should respond with some level of support for homeowners for mitigation to show that they are invested in the long-term interests of communities. Civic investment in communities by local governments brings communities together and enhances trust in and support for programs sponsored by the government (Glaser and others, 2002). State and county governments have established administrative means (institutional capacities) for mitigating other natural hazards, such as earth quakes in California, including limits on development, zoning, and safe building codes for home construction. Professionals and publics need to explore and develop means by which state and federal agencies can assist local governments—beyond providing funds—in establishing administrative capacity for wildfire risk management.

- The interface fire problem is one of shared responsibility, capacity building, and involvement of many organizations in addition to homeowners and land management agencies (Davis, 1990; Davis and Marker, 1987; Plevel, 1997).

Restoring Healthy Forests

Many agency managers, scientists, conservation groups, and citizens' coalitions working on the interface fire problem have moved beyond assigning responsibility to individual property owners and land management agencies. Some have framed the problem as a broader regional issue focused on long-term restoration of forests, watersheds, and fire dependent ecosystems (Dombeck and others, 2004; FRFTP, 2004).

- Defining the issue in terms of forest health fits well within the framework of adaptive ecosystem management, but may present difficulties for integrating social factors into new fuels management approaches.

What people think they know about the connections between reduction of fuels, restoring forest health, "good ecology," and the frequency of destructive high-intensity wildfires is certainly part of the public-professional understanding. However, additional uncertainties creep into this definition of the problem because the concepts of forest health and restoration have changing definitions that may never be consistently accepted by various stakeholders. For instance, how will we know when the forests are healthy once again, and by whose definition—public or professional—will we make the judgment? To what prior condition are we restoring forested landscapes? Which restorations will be

acceptable and maintainable (Hull and Robertson, 2000)? For what fire regimes are we managing and for how long will we be willing to do so (Shindler and Brunson, 1999)?

Framing the WUI fire and fuels issue as one of forest health and restoration raises big questions because, in addition to holding multiple meanings for various people, the extent of wildland fire in North American landscapes continually changes as climate and vegetation patterns, habitats, and humans with their land management agencies, policies, and practices—including fire use and suppression—change through the centuries (Brown, 1999; Pyne, 2004). The complex interactions between climate, vegetation, and wildfire are expected to further shift in ways that are not completely predictable as a consequence of global climate warming (McKenzie and colleagues, 2004).

Ecological principles of forest health and restoration are important but, coexisting with wildfire today is primarily a social problem (Dombeck and others, 2004) that requires a *process of adaptive collaboration* between public and professional stakeholders. Forest managers, ecologists, mitigation experts, and interface residents need to adapt common understandings regarding what forest health, conditions, and ecological restoration actually mean for those who live and work in interface communities.

- Before framing the interface wildfire and fuels problem as one of forest health and restoration alone, researchers, managers, and interface communities need to clarify where, when, and how competing definitions of forest health and restoration can be productively integrated into fuels reduction projects.

Building Relationships and Capacity with Adaptive Collaboration

Social acceptability[3] is a process rather than an attitude or a predictable outcome (Shindler and colleagues, 2002; 2004). This changes the focus of the work from *what* we know and wish to influence to *why* this is so and *how* we can achieve mutual understanding about fuels policy so that we might implement legitimate management in the interface that is sustainable.

- Public acceptance of fuels management cannot be captured and controlled by managers and educators, but these professionals can participate with publics in a process of coming to common understandings.

Collaboration is a means to adequate acceptability. Collaboration has been described as identifying key partners (White, 2004) and building and sustaining interpersonal relationships. Open "two-way interactive flows of information" between public and professional participants, flexible changes based on feedback, and building respect and trust (Wondolleck and Yaffee, 2000, p. 105) characterize adaptive and collaborative relationships.

The purpose of developing collaborative relationships is to foster communication and provide opportunities for individual and group decision making, which builds capacity (Innes and Booher, 2003; Wondolleck and Yaffee, 2000). Once stakeholders understand

their differing values and common interests and develop mutual relationships of trust—the why—they are enabled to make decisions to work together during projects to reduce hazardous fuels in and around their interface homes and public lands.

In collaboration, stakeholders *learn* about management options, ecological foundations of alternatives, and risks and costs of alternatives (Shindler and others, 2004). Collaboration has to be adaptive to account for mistakes during the learning process that are inevitable while building relationships of understanding. According to Castle (2002, p. 344), collaborative "efforts that result in improved understanding among groups in order to enhance inter-group decision making" are similar to sacrifices or investments at the present that facilitate the formation of *social capital* for the future.

A community's ability to accomplish fuel reductions and lower potential risks depends on social capital—the norms, relations, trust, and networks in a community that enhance its abilities to achieve social and economic well-being (Castle, 2002; Jakes and others, 2003). Collaboration sows the seeds of capacity in the productive soil of open communication.

- Capacity—the how—starts with collaborative partnerships of diverse interests such as the FRFTP Roundtable[1] and can grow from these established but dynamic relationships into communities, local governments, and regional administrations, but nothing grows without *two-way inclusive communication*.

- Collaborative policy making through partnerships is judged for success by whether or not it builds the capacity of actual interface communities to be self-organizing[4] and sustainable in their wildfire learning, preparedness, and fuel reductions (Chaskin, 2001; Innes and Booher, 2003).

Focus on Communication

Many people living in WUI communities are currently informed about wildfire risk and how it might be mitigated. But how stakeholders communicate about wildfire and fuels mitigation, both within and across their boundaries, and before, during, or after wildfires, differs from place to place, changes, and is at best partly understood. The interface fuels issue is controversial and debated by various groups at various management levels.

Many interface residents want early/often/and ongoing involvement in forest, wildfire, and fuels management, particularly when these directly affect their lives (Farnsworth and others, 2003; Wondolleck & Yaffee, 2000). Residents want to be better informed about what direct actions they can take, with whom they can work to improve conditions, and how to build better relationships with land managers (Burns and others, 2003; Edwards & Bliss, 2003; Farnsworth and others, 2003; Opio, 1999; Shelby and others, 2004; Tuler and Webler, 1999).

- Open and productive communication is expected among property owners, commercial foresters, and government agencies regarding management activities that affect safety, lifestyles, and property (Edwards & Bliss, 2003).

Resource conflicts often are rooted in a lack of effective communication and trust among stakeholder groups. The success of cross-boundary collaborative management hinges on understanding communication processes and related barriers and facilitators (Jakobsen and McLaughlin, 2004). This study focuses on communication because it is important for relationship building, stakeholder engagement, and collaborative learning for fuels projects.

Methodological Approach

To enhance public understanding and collaboration, both professionals and residents working in the interface will need to move beyond technical information reformatted and packaged to educate the public to accept and support treatment projects (Shindler and Brunson, 1999). Public acceptance of land management happens in open dialog that facilitates mutual understanding. Communication "must not only provide information but also focus on how people come to understand forest conditions and support policies for fuels reduction" (Shindler and Toman, 2003, p. 14).

- Accordingly, we designed and conducted an in-depth interview study to facilitate interactive dialog, openness, and mutual understanding. By talking to people in interviews, we built a key recommendation or prescription into the study at the beginning—talking and listening.

Key Informant Interviews

We interviewed 16 individuals representing key players working on the interface fire problem and residents of WUI communities in the Front Range. These interviews identified core dimensions of the issue including history, present state-of-knowledge, and future considerations. We directly asked these informants about what citizen and professional groups to include in the group interviews and if they might recommend additional persons to be interviewed. Key informant interviews addressed:

1. Backgrounds of interviewees (and history in/attachment to place for residents)
2. History of wildfire in the Front Range
3. Contemporary aspects of the issue
4. Future aspects, considerations, and insights
5. Informants' social networks of influence—who do they talk to about fuels management
6. Collaborative planning, communication, and decision making
7. Influence of science, education, and media

We interviewed a public relations officer with the federal forest service, a county-level wildfire specialist, two foresters with the state forest service working with private

landowners in the WUI, a social scientist who studies national wildfire issues, a local recreational visitor on a Front Range national forest, a journalist who covers wildfire stories, and nine residents of interface communities. Insights learned from the informant interviews were used to formulate questions for the group interviews.

Focus Group Interviews

The group interviews focused on the broad context of the mission of the FRFTP to reduce hazardous vegetative fuels in the Front Range over the long-term. Ten group interviews were conducted to document, through discussion and group interaction, stakeholders' concerns and perceptions of wildfire and fuels management in the Front Range (Table 1).

Most interviews were conducted with previously existing groups during their regularly scheduled meetings on location and at their convenience. This allowed us to represent citizens and natural resource professionals who may not have attended an agency- or university-sponsored meeting because of time and travel constraints (Smith and McDonough, 2001). We essentially went to stakeholders who were already organized around some aspect of the interface wildfire and fuels issue in the Front Range.

Group interviews were guided conversations between participants and researchers (Mishler, 1986) about how participants defined the interface wildfire issue and any barriers or facilitators that they recognized. We followed flexible guides prepared in advance (Greenbaum, 2000) to cover our research objectives. Interviews were audio and video recorded to save the record for analyses. Interviews were moderated by one observer that recorded sessions and one facilitator that asked questions of the groups to maintain focused discussions. Facilitators used probes to explore interactions between participants. Follow-up questions were used to clarify information as needed.

Qualitative Analyses

Each interview was followed by timely transcriptions, preliminary analyses, discussions, and a process of *plowing* or incorporating what was learned *back into* our flexible research approach. In other words, important information from earlier interviews often was used to inform the question guide for the next interview. In addition to informing the development of interview guides, this adaptive process guided selection of stakeholders.

After the entire set of interviews were completed and transcribed, each text was edited and loaded into the software program Atlas.ti Version 5 for Windows for storage, indexing, and coding. Group interview transcripts were independently analyzed and coded for themes by two of the authors. Differences and similarities resulting from these independent reviews were discussed together by the two analysts to finalize the interpretation for this report. Results are still emerging as analyses continue. A list of preliminary themes with descriptions has been developed (Appendix A).

Table 1. Stakeholders interviewed for the Front Range fuels treatment study, 2004.

Focus Group	Interest	Location[1]	N	Interview Length[2]
FRFTP1	Professional	Denver	5	14
VFD	Professional/Public	Teller	5	24
NGO1	Professional	Boulder	6	23
FRFTP2	Professional	Denver	5	14
CUSP	Professional/Public	Teller	7	10
WUI	Professional/Public	Larimer	7	27
NGO2	Professional	Denver	3	20
MEDIA	Professional/Public	Larimer	2	21
PLAINS	Public	Yuma	6	24
PPWPP	Professional/Public	Elbert	5	18
Totals	__	__	51	195

[1] Colorado city or county where focus group interview was conducted.

[2] Number of single spaced pages of interview transcript.

FRFTP1 = State and federal agency mid-level personnel working in the Front Range Fuels Treatment Partnership on collaborative planning and administration.

VFD = Volunteer fire fighters and WUI residents.

NGO1 = Conservation professionals with a non-governmental organization working on wildfire issues in the Front Range.

FRFTP2 = State and federal agency mid-level personnel working in the Front Range Fuels Treatment Partnership on public relations.

CUSP = Members of a non-profit citizen's coalition called the Coalition for the Upper South Platte Watershed Restoration.

WUI = Homeowners and full-time WUI residents including volunteer firefighters.

NGO2 = Conservation professionals with a second non-governmental organization working on interface fire issues.

MEDIA = Media journalists covering wildfires in the Front Range. One wrote for a newspaper and the other was a WUI resident and university instructor of journalism.

PLAINS = Citizens living in a farming community on the Eastern Plains near the Colorado-Nebraska border including volunteer fire fighters.

PPWPP = Members of a collaborative wildfire and fuels initiative called the Pikes Peak Wildfire Prevention Partners including volunteer firefighters and WUI community leaders.

Discussion of Study Findings

Identification of Stakeholders

People living in Colorado's Front Range are diverse with varying degrees of interest in and experience with forest management, wildfires, and fuels mitigation and differing perceptions of risk from wildfires. All are affected in some way by wildland fire. We have identified three broad categories of stakeholders for consideration when discussing people, wildfire, and fuels in Colorado:

- People that have a professional relationship with the problem
- People that have a personal relationship with the problem
- Citizens living where forest fires rarely occur such as urban and farming communities, and who may believe that they have nothing directly at stake

These broad categories are not mutually exclusive. For example, we often interviewed professionals working in education or fuels reduction projects who reside in interface communities prone to wildfire. Citizens in the rural east and Front Range cities have a personal stake in wildfire if they vacation and recreate in the forested interface zones. Several groups have been identified and included in this study and in the broader collaborative efforts of the FRFTP-sponsored Roundtable meetings (Appendix B).

Public-Professional Understandings of Fuels Management

The main research question addressed in the progress report asked how public understandings of fuels management compare to those of professional experts. We address this question with an integrated discussion of our observations and interpretations of group interviews. Excerpts from some conversations are included to clarify and support the discussion.

Theme I: Increased awareness without self-organized action[4]. Some professional groups that we interviewed recognize that public awareness is high and wildfire and fuels have become salient issues in the Front Range, but often professionals do not understand why increased awareness has not translated into more action on-the-ground to implement fuels reduction projects—why don't people mitigate after being informed?

- *Changing attitudes and behaviors* by educating and dispersing information remains a prevalent mind-set, but by itself this strategic definition of the problem is inadequate for building the capacity in interface communities that is necessary to organize, fund, and start fuels reduction projects.

Some residents said that they had changed to metal roofs in years past—they have Fire Wise and defensible space information and can readily repeat it, but often seemed to lack the organization to get projects funded and underway. As evident in the following interview excerpt, residents often know what to do and why but not how to take action:

> Resident A: … we talked about it but … the thing is getting to the next step—okay there's funding available. There are resources. Okay, how do we get to those, and how do we make it happen?
>
> Resident B: There is technical assistance through the state forest service.
>
> Resident A: Okay, now meaning what?
>
> Resident B: They will come out … and they will take a look at it. They will analyze it for defensible space
>
> Resident C: Basically, they want you to have a green belt around your immediate house.
>
> Resident A: We know what it is. I know what it is. I don't need someone to put me in a database. I just don't have the resources or the money to make it happen.
>
> Resident D: … I think that the communication chain—the information exists in pamphlets and flyers, so people know about mitigation, but the resources to necessarily do everything that needs to be done maybe is missing.

During this interview with WUI residents, a barrier to success was identified for large-scale fuels reduction projects that are also self-organized:

- Mitigation requires decision-making and action by a single like-minded entity, but all the different people who own the trees across the landscape can't come to an agreement. This highlights the need for communities to work together, over time, toward mutual understandings, relationship building, and self-organization.

However, self-organized communities working together to reduce fuels take time to develop because relationships take time. The barrier to collaboration is that some interface residents often are interested in being alone in the forest, and they are not *yet* trusting of collaboration and group mobilization. Some come together and talk during fire events and for social occasions, but many stay to themselves most other times.

> Resident E: … another thing you guys got to realize out here in the middle of nowhere is the people move here to be out in the middle of nowhere to get away from people. So to get them involved is not that easy. Look at myself. It took me five years to finally join [the volunteer fire department], and I've been passing them every day on the way to work … I didn't come out here to get involved.

An interface community's level of self-organization to mitigate wildfire risks does not depend on how much information they have received or for how long they have been receiving it. The readiness of a community to mobilize and begin fuel reduction projects may often depend on how long they have been talking about the issue between themselves and outside partners.

IMPLICATION: Across the Front Range, interface communities are at different levels of self-organization. One of the first steps for professionals and citizens working on community-level fuels reduction projects is to identify a community's level of self-organization and readiness to mobilize—have they established any relationships of trust?

Theme II: Differences of scale. Different definitions of the scale of the wildfire and fuels management issue emerged for professional and public stakeholders. Some interviewees in professional agency and conservation non-governmental organizations (NGO) consider the interface fuels issue to be one of broad scope "Front Range-wide" not an issue at the forest level or the ranger district level.

- Wildfire and fuels management in Colorado's Front Range has been framed by some professionals as a *landscape level problem* requiring a *cultural shift* in thinking about forest conditions *over the long-term*.

Residents of Front Range WUI communities that we spoke to are aware of local threats from wildfire. Large portions of conversations between residents focus on public safety and evacuation during fire events. Interface residents are concerned with the local situation and not necessarily the broad region of the Front Range as is the case for some professionals.

- Interface residents told stories of wildfires, interface house fires, and evacuations that they had experienced. An *evacuation-suppression-public safety* mind-set was evident in the dialog, including how to evacuate livestock and pets and what to do about neighbors who are not home during a fire. Residents spoke of organizing phone trees to facilitate evacuations. Communications during a fire and getting up-to-date information about the status of the fire are important.

Some residents are familiar with a broader way of thinking about the problem similar to that of some professionals, but they recognize that landscape restoration would entail an effort beyond individual homeowners and communities:

> Resident A: And this [funding] is to reduce the risk of defending a home or … you can't take everything away?
>
> Resident B: You know what—who are the source of all this money—the feds, what they are into is reducing the hazard of the natural fuels. The whole idea is to restore the forest to a healthy state, so that fires …
>
> Resident A: … You'd have to [mitigate] all over everywhere in the canyon not just around somebody's house, if that is the case?
>
> Resident B: Well, they are willing to focus early on the natural hazard areas that threaten communities. For instance, if we could (chuckles) conceivably organize everybody who owned the trees on this ridge, and have them act as a single entity—decision making as one entity—I bet that we could write a grant proposal that said, 'Let's get some mechanical thinning going on …'
>
> Resident C: … beetles—get all the dead beetle wood out …
>
> Resident B: … yeah, and then I think that there would be a reasonable shot at that. The feds think big!
>
> Resident D: Yeah, it's going to have to be a huge area to bother with making the effort to do it …
>
> Resident B: But, they realize that so much of the hazard land is private, and they recognize that is a problem, so … they tell these state foresters to act as a middle-man to try to facilitate this grass roots organization, but it is so very difficult for them because there are so few of those people.

- Some people living in the interface recognize disconnect in attempting to apply a broad landscape approach to address a small-scale problem. One barrier is identified in that there are not enough community-level forestry professionals available to engage and help organize the many communities in the region.

IMPLICATION: Professionals and publics need to continue to seriously discuss and perhaps come to some level of consensus over what is actually at risk. Are Front Range interface *communities* and *homeowners* at risk from wildfire or is *the region* of the Front Range at risk?

Theme III: What does forest health mean for fuels reduction? We interviewed conservation groups and agency foresters concerned with forest conditions. Some professional ecologists and project managers that we interviewed think that the fuels issue in the Front Range provides an opportunity to get people talking about conservation—a catalyst. It brings folks together. The interface fire issue "requires agencies to work together and to communicate like they never have before," which facilitates cross-boundary relationship building as in the case of the FRFTP.

- Does a view of wildfire in the WUI as a catalyst for conservation imply a *forest health and restoration definition* of the problem? Some agency professionals and some conservation-minded NGO professionals define the issue in terms of long-term forest health and restoration of fire dependent ecosystems (FRFTP, 2004).

- Under a forest health definition, success might be defined as the longevity of "healthy Front Range forest conditions" and high levels of biodiversity. The problem with these criteria for success is that they have multiple and changing definitions.

In the dialog below for example, NGO members of the conservation community describe how the concept of forest health differs for residents with whom they work:

> Interviewer: Do you see the WUI public as understanding the connection between forest health and catastrophic fire? That is how it is posed … you hear things like … 'we have unhealthy forests and once they are healthy again, we are not going to have this problem' …
>
> Member A: I think no. I think no. They are starting to get the idea that the forest needs to be thinned, but no, that's pretty sophisticated. They just don't want their house to burn down …
>
> Member B: In our area, people that are living in the red zone—the WUI—tend to not be thinking about [forest health]. It is the large land owners with large forested tracts that are very involved in the very cooperative planning process. I think that they see that they have a much greater connection to the land because they have a huge amount of it …Whereas the 45-acre tract owners—they are worried about it, but they don't see forest health as the solution.
>
> Member C: It's more of a defensible space issue …
>
> Member B: They are thinking about sprinklers and how far away a tree should be from their house and metal roofs. They are not thinking about forest health.

> Member D: Is it fair to say … that some of the large tract land owners, once engaged in the subject of what is forest health and bringing some good science to it, are pretty open to the idea are pretty enthusiastic?
>
> Member B: Absolutely, they see that a healthy forest fits every single one of their needs in terms of aesthetics, recreation, and hunting. A huge thing in that area is recreational hunting, so a healthy forest is good habitat for the game species, so everybody that has been exposed to it, they usually grab on pretty good. It is more difficult with the small land owners.

As evident in the preceding excerpt, landscape-level approaches to fuels reduction may resonate with some residents who own large expanses in the interface. Perhaps some large landowners who are interested in improving habitat for preferred wildlife and who are intimately familiar with large tracts of land because of heritages in agriculture or forestry, share professional definitions of the issue such as improving optimal, viable, or "healthy" forest conditions.

The WUI residents that we interviewed were small landowners and tended not to frame the issue in terms of forest health and landscape restoration. We recorded residents discussing local issues of safety and homeowner assistance. But other small property owners in the Front Range WUI may be interested in restoring wildlife habit in and around their communities, for example, and therefore may think in terms similar to professional definitions of forest health in addition to public safety and defensible space.

- Both forest conditions and community protection are important to the mission of the FRFTP, but professional and public understandings often do not match regarding the relationship between restoring "healthy" conditions and fuel reductions that may provide benefits by lowering risks to life and property in Front Range communities.

IMPLICATION: Project-level professionals and citizens need to clarify where, when, and how or even if different ways of understanding forest health and restoration can be productively integrated into fuels reduction projects. Perhaps for some large land owners and for large tracts of uninhabited public forest lands restoring agreed upon conditions can be applied. However, in interface communities comprised of small properties, it may make more sense to discuss "healthy" community conditions such as feeling both safe and emotionally content or pleased with life in a *wildland-human environment*.

Theme IV: Can the Front Range population coexist with wildfire? A major aspect of the forest health frame of reference is restoring fire. In the scenario, land managers would increase the use of fire as a tool, and naturally occurring wildfires that do not threaten people would be allowed to burn more often than under the strict suppression policies of the past.

But some professionals involved with the issue in the Front Range currently question the feasibility of coexisting with wildfire. It is highly uncertain whether people understand what coexisting with wildfire and increased levels of prescribe burning might entail:

> Member D: … I'm not sure we Coloradoans really understand what getting a healthy forest entails … [in parts of the southern United States, for example] … they are much further ahead on this problem. They have regularly prescribed fires and those sorts of things, but it means not building in certain areas and therefore condemning people's property rights. It means lots of prescribed fire and smoke pouring out of the forests and having to deal with that—the effect on communities. It means not being able to recreate in certain areas when those things are going on. I'm not sure—you know everyone is for healthy forests, right—but I'm not sure that we can make that tangible choice at this point with what we face today and with that system that maintains what a healthy forest looks like. I'm not sure that we know what that is.

Collaborative partnerships comprised of both private citizens and natural resource professionals were interviewed. Members discussed the relationships between renewable energy, forest health, and restoration of fire dependent ecosystems, but they are not completely in agreement about how these translate into healthy forests—do we manage for fire-adapted landscapes by thinning/developing renewable fuels or will natural processes eventually maintain "healthy" fuel levels over the long-term or both?

> Member A (cautioning): I think that it is important when we do [talk about renewable energy and economic development], though, not to characterize it as too renewable. There is a lot of [fuel] out there, but the whole idea is to get rid of it. In setting up the plan for the future …
>
> Member B: It will never be complete.
>
> Member A: But to say it's renewable as though we are going to build an economy on refreshing what we are trying to get rid of is a big mistake.
>
> Member B: Well *nature* does that.
>
> Member A: No, if we're managing the land right, we're restoring conditions that can then accommodate the right kind of fire—we don't *want* those fuels back.
>
> Member B: I know. I know we don't.
>
> Member C: But they're going to come … the small diameter timber is going to grow up in the absence of management, and then you're going to have a harvestable supply, that's all I'm saying.
>
> Member B: You are going to move as you are harvesting. You're constantly moving and you harvest this area, and then you're over here, and then you're over here, and by the time you get back around here, you've got more stuff to harvest.
>
> Member C: Right.
>
> Member A: No, that's what we *don't* want to happen.
>
> Member B: That's what I'm talking about when I say, 'Nature's going to do that.'
>
> Member D (agreeing with A): But B, if you're then letting prescribed fire and other techniques and natural fires that burn in an open forest that's healthy, you shouldn't have to convert—the little ones are burned off and you shouldn't—now, it's not an issue within our lifetimes. I mean, we could have 50 years worth of bio-fuels off of these forests, but …
>
> Member A: I'm not arguing with that.
>
> Member D: … but A is right. If we're doing this for the stewardship and the ecosystem, we're not going to say, 'Okay, we've cleared this, now we're not touching it for 50 years, so in 50 years we can come back in and re-harvest.' We should be doing prescribed fire and other *maintenance* techniques so once that's cleared and back to its healthy status it is *kept* healthy. So theoretically, it might be 50 years, it might be a hundred, but at some point in time we would have … if the *mission* of the Front Range Fuels Partnership is followed through … when we talked about mission

> driven, if you meet the mission, it is to get it back to healthy, and then keep it that way, so in that scenario you are not going to re-grow the small fuels again.
>
> Member C: You will on the private land, because I don't think the private landowner will manage, and the federal agencies haven't managed for a hundred years, I don't think the private landowners will …
>
> Member A: Then you're not solving the problem.
>
> Member D: You're not solving …
>
> Member C: … I'll say more realistic, I think, yeah, the theory is great, but I think in application, you're going to have some problems.

Professionals working on the interface fuels problem, including many agency and NGO representatives we interviewed, acknowledge that all forests in the Front Range are not equal regarding fire frequency and intensity—thereby suggesting limitations to applying simplified standard approaches to reduce fuels across the region:

> Member E: … Managers often tell people that if we make the forests healthy, then the risk to their homes is reduced. There is a disconnect there because we have this Ponderosa pine forest paradigm where we believe that once we have these widely spaced trees, we will have surface fires and that's how things are supposed to be everywhere, and clearly that's not the case. That's the case in a few Ponderosa pine systems in the south west and that paradigm has been translated to every forest. In the Front Range, we are dealing with a lot of mixed fire regimes where we are still going to get crown fires, and we are still going to see buildings burn whether the forests are in their historical range or not … it is a perfect example of how we have transferred this one paradigm about this one system that is easy to understand—surface fires are easy to understand—to everywhere, and that is a problem with the way we communicate the message because it brings the science down to a simple level and it is easy to communicate that message, and it is a much more complex picture than that. It is highly variable across the whole country. I don't know how to fix that, but it is a huge problem in the Front Range that has to do with this idea of fire in the west.

Public and professional understandings of coexisting with fire in a fire dependent ecosystem are confused when the relationship between wildfire and forest conditions is communicated in over simplified terms:

> Interviewer: … on the concept of forest health, which is sort of complex too for the public … do they make the connection that healthier forests will mean less catastrophic fire? Is that connection made with home owner's associations and communities?
>
> Member A: It is a tough question because I'm not sure that there's any [connection] even for us … what is a healthy forest? Scientists don't agree all the time what a healthy forest is. Healthy forests burn.
>
> Member B: It won't necessarily reduce fires …
>
> Member A: Yeah, healthy forests burn, and it maybe catastrophic from our viewpoint within the next three years—that was a catastrophic fire—over the long term, that is a healthy forest burning in the way that it is supposed to burn … I think that one of the dangers when talking about the media and the messages and healthy forests—the danger is that the media has set up an expectation that healthy forests don't burn; that we can eradicate fire; that we will protect you and prevent fire, and that might be one of the most important missing links that isn't getting to the public—healthy forests are variable. Healthy forests look like a lot of different things and the

> healthiest of forests burn and some of them burn *hot* and some of them will destroy anything in their path—that doesn't mean that somebody has failed necessarily. I think that is a disconnect—the public is [hearing] 'protection from fire', 'the eradication of fire,' …you see the words like 'prevention of fire,' and you see that in the media, and that sets it up poorly for the public.
>
> Member B: There has been a simplification of the message. It has gone from sort of the Smokey Bear prevent forest fires to some understanding of the role [of] fuels and fire suppression and forest structure, but it is now caricatured in this overly simplistic way that the only healthy forest is a *thinned* forest and that is a terrible misconception in these complex forests even in the Ponderosa pine zone, we are learning that is not how it necessarily happens.
>
> Interviewer: There is no generalizable solution?
>
> Member B: There is no board—there is no single prescription that you can apply across the landscape to produce a *healthy forest*.
>
> Member A: … there is no place where you say, 'Oh good, we are done. Oh good, now the Front Range is safe, and our forests are *healthy*.' There is no such finish line. … the media have set it up where—public conception has it set up that one day we will cross that finish line, and we need to work toward this identifiable goal, and it is really very vague … even in the minds of fire experts.

- Transferring principles of wildfire learned from studying the Ponderosa pine forests of the southwestern United States to the entire Colorado Front Range presents a barrier to fuels reduction defined in broad terms of forest health and restoration.

- The Front Range is ecologically and socially diverse and the outcomes of fuels management are often uncertain, which makes the use of simple and standardized messages about solutions for the interface fire and fuels problem inappropriate. Fuels reduction projects designed for the northern Front Range counties may differ substantially from projects designed in the southern part of the region.

IMPLICATION: When discussing forest conditions with specific WUI communities or different publics in the Front Range, professionals working on fuel reduction projects and/or in public relations should be clear with people that the forests of the Front Range are characterized by different conditions, vegetation types, and fire regimes. The one consistency that is important to communicate is that forests in this region tend to burn and that will most likely continue.

Theme V: Building relationships case-by-case over time. Examples of productive relationship building between professionals and publics were often described by fuels project workers as processes of regular communication and trust building. Together professionals and publics consider local desires, goals, values, economies, and local land and fire management issues and incorporate these into mitigation projects:

> Interviewer: One thing that you have not mentioned is knowledge. Is there a lack of knowledge or do you feel that when you are out [in communities], you are getting the sense that people really know?

> Member A: Well that is what we are bringing to the table I think is developing knowledge. We don't have it, but we are working as best as we can to develop the knowledge. They trust us. I would say that about 90% of those land owners ... would believe what we told them because they know that we are constantly working to try to get the best available knowledge. [Together we have] developed a fire history for the area, and they are really excited about that. There are still knowledge gaps, but at least in [this place] we have been trying to fill those knowledge gaps.
>
> Member B: I think that they have been working hard to get to that point …
>
> Interviewer: … How do you not, in a sense—if they will listen to anything that you say—how do you collaborate with them? I imagine that you try. You want to listen; how do you do that when you are communicating with [land owners/communities] to see what their needs are?
>
> Member A: In the one case, a land owner … is going to do work on-the-ground based on what we tell them, they have a set of their own things—what we give them will be just another part of that—they have their wildlife goals, and they have their aesthetic goals, and we give them information on what the natural forest history would look like, then we help them work through how they can all work together.
>
> Member B: In a certain broader sense in communities … we sit at the community table, so [someone] literally once a month goes to these community meetings that are completely collaborative that are consensus based with stakeholders from the whole community sitting down together to talk mostly about fire … in all communities that we work on in Colorado on fire issues, that is the case—we have that sort of community-level group to develop consensus on fire issues.
>
> Member C: It is sort of the coalition of the willing for lack of a better phrase. … Everybody starts showing up, and they are interested in this. What [we do] … is walk them through a process … a process for defining a community vision for what they want to get done in their forest. It takes into account community protection and watershed protection and whatever are the goals folks have … it is similar to the process being used by other agencies and communities. It is designed to incorporate non-biodiversity goals if that makes sense. It is not a template. We just don't hand somebody the plan and say you tell me why we should do anything different.
>
> Member D: That is in our approach … You've got fire and you sort of find out here is our mandate here is your mandate or interest where do they overlap. That is where we can sort of first come together and then work out the sides I guess, and also bringing—I think that this is important—something of value, in your case information, so that kind of gets you a seat at the table in a sense. … It is important to provide some kind of value, especially if you are not prominent in that community.

This approach to collaboration is described by interview participants as long-term often taking several years. Project-level workers from both agencies and NGOs discussed their success stories in terms of attending homeowner's meetings every other weekend for five or more years.

- Today, most natural resource professionals are stationed in a central location making regular on-the-ground interaction difficult and expensive. How can professionals and publics working toward mutual understandings of fuels management in the interface build relationships of trust more efficiently?

In addition to using live-in researchers and extension agents similar to anthropologists who traditionally do years of participant observation in communities, professionals can target the relationships that already exist in the interface communities. To facilitate

relationship building, trust, and credibility, projects workers and wildfire mitigation experts can identify and harness the leaders and the groups that are presently organized. In the excerpt below interviewees describe how this is working:

> Member A: … there is a group of folks there [from a NGO] involved in some science support work. Some of the opinion leaders there are fired up about it, and they probably couldn't even tell you the name of the governor let alone much about forest health, and I'm not sure that matters because the right people to make things happen are now informed and excited about it. It is just a different approach. These community coalitions—where they exist—seem to be getting some attraction … The Upper South Platte and others. It seems like a reasonable way to organize, and then that has an organic effect. Those people are members of the community and are talking to their neighbors every day and have the ability to spread the word more than some one in a forest service uniform going door-to-door. … We actually hear from agencies that there is a credibility gap—even if [an ecologist] is saying exactly what's needed for the forests, he or she is wearing a U.S. Forest Service uniform and works for the people who are largely responsible for creating the problem in the first place. …There is deep skepticism and a jaded outlook especially from groups that are national in scope … that's the value and ability of these local partnerships is speaking by proxy—it is better to have a local advocate for this thing than someone from the forest service.
>
> Member B: I think a piece of that is figuring out who in those communities within your stakeholder group is going to be the right person. It might not be the one who immediately comes to mind at the top or the chair person of that board or whatever because as we find out in community-based conservation, often there is someone who is much more influential for the community as a whole, and the person who appears to be in charge has a leadership role, and we find that out by living in these communities and being a part of these communities, so that's not something that you can figure out immediately, but that is clearly to me one of the reasons that we are successful in a lot of these landscapes because we work with people who are influential in the community, and that may or may not be a structured role.
>
> Interviewer: Do you just keep going back and keep talking until you finally find that person?
>
> Member A: … that is generally how it works. It is a year-long process to engage in a community so by the time you actually do something on the ground … That's a useful way to think about it. In that community, who are the major players … so chunking up the Front Range into how communities think of themselves and thinking about who the right players are. … It is just different in every community. I think it is just asking people who are focused on that community.
>
> Member B: In terms of homeowners, that will probably be really important. Figuring out—who in literally a community where people live—who's a leader? Who does everyone listen to? Who do people go to when they want an answer? It is probably not the county commissioner. It is probably the guy on the corner who has lived there for 25 years or whatever.

Regular contact, interaction, and some type of credible presence are necessary in interface communities over the long-term to establish relationships. Collaboration is more effective if most of the trusted people (including those in professional roles) at the discussion table live in or close to the community.

- Collaborative partnerships and coalitions are valuable for relationship building and to establish credibility for fuels reduction projects especially when some of the partners actually reside or are respected leaders in WUI communities.

- Partnerships and coalitions have to bring their established relationships of trust and human resources to the discussion tables in local communities in order to be successful. Liaisons exist in citizen's coalitions and local partnerships and can provide critical links between professional and public understandings.

IMPLICATION: Professional-public partnerships must enhance their abilities to identify and include more interface residents and community leaders in their discussions about reducing the risks of destructive wildfires in the Front Range. Those who live with fuels build up in fire-prone areas are valuable partners in that they can adapt understanding learned from higher-level collaboration with professionals to fit projects in their home communities. In this way, inclusiveness facilitates the process of public acceptance and mobilization on-the-ground.

Overall Preliminary Insights

The following bullet points are preliminary and may be revised for the final project report. Our analyses and understandings of the study results are ongoing and evolving. However, the insights herein are grounded in 18 months of data collection, preliminary study of empirical interview data, and extensive reviewing of published and unpublished studies of people and wildfire in the WUI.

- Multi jurisdictional communication and lack thereof drive conflict and misunderstanding over fuel reduction projects in WUI communities.

- People need to know more about who is doing what in relation to fuels and wildfire management and how it affects them and their neighbors as residents of the interface—local fuels reduction projects require large amounts of local participation and exposure.

- Consistent and trustworthy interaction and dialog between officials/agency representatives and WUI citizens overtime regarding fire and fuels management—the good neighbor forester, private land manager, and familiar county extension officer—can be effective but often costly.

- Taking an isolated point of view of the interface fuels issue such as public safety, property protection, natural resource protection, forest health, or a private land problem may be less productive, in most cases, than establishing it as a problem of building community capacity and framing it as everyone's responsibility. This approach has the potential to integrate various definitions of the problem.

- Some interface communities may see their situation primarily in terms of one of these frames, for example, wildlife habitat restoration or "healthy" forests. In such a case, professional workers helping with fuels reduction projects might initially phrase their ideas for education and mitigation in terms of forest and habitat restoration to match project goals with community goals.

- If a community has come to understand their situation primarily in terms of public safety, professional project collaborators might focus on defensible space, evacuation plans, and building up resources for the local fire department.

- There is confusion in some communities about where to get financial assistance for mitigation projects and about what to do with mitigated vegetation.

- The media will consistently cover the destructive and heroic nature of wildland fire and firefighters—the "real news" stories are inevitable. Government and private wildfire communication specialists must continue to forge relationships with people in media to understand how and when to best present stories about how to coexist with wildfire in the WUI.

- Proactive residents who do mitigate seem to be well studied. Case studies tend to under-represent people who do not mitigate. There may be many unrecognized barriers to mitigation and sound reasons why some people do not or cannot mitigate their properties.

Future Directions for Moving Understanding Forward

These future directions may be facilitated either by the FRFTP-Roundtable efforts, by citizens' coalitions and partnerships, or by research. Some of these bullet points will be best pursued by a combination of entities working together over the long-term.

- Current and future studies and on-the-ground project activities must remain focused on community engagement and involvement. However, communities differ with regard to their philosophical views concerning natural resources, wildfire history, and what it means to live in a WUI landscape. These affect community responses to fire, fuels management, and rehabilitation after wildfires. Thus case study and local place-based projects are critical.

- Stakeholder network maps that describe the key groups and their positions on fuels reduction, their resources and methods of operation, and potential linkages and partners could be developed as useful tools (see research question 2). It is important that maps be seen as snapshots that can be adapted as social conditions and relationships evolve.

- We know more about the people who do mitigate than the people who do not. Thus, we need to study people who do not mitigate to clarify the barriers to and

facilitators of community preparedness and collaborative mitigation (see P. Champ and others' FRFTP Progress Report FY04).

- Communication and two-way responsiveness between county governments and WUI communities/home owners associations might be directly studied in the context of forest management in general and fuels reduction specifically on a case-by-case basis.

- Community capacity to engage in fuels projects is not completely understood. How do collaborative and trusting relationships form? Are there any tangible motives for mitigating? Where are the resources? Who are the best leaders? What about economic incentives and home owner insurance (see Williams, Jakes, and others' Joint Fire Science Proposal, 2004).

- In a given community, how do newcomers to the interface (and urban-to-WUI migration in general) affect community capacity and communication?

- Communication and public relations studies above and beyond information dissemination and mass media campaigns are needed (see J. Champ's FRFTP Progress Report FY04).

- What do the concepts of forest health, forest conditions, and ecological restoration actually mean to WUI residents? Where and under what condition might these concepts be successfully integrated into collaboration and mitigation projects?

- Evaluation of fuels reduction projects and criteria for success for collaborative partnerships should focus on whether or not efforts are self-organized and sustainable—has capacity been enhanced or hindered on-the-ground for WUI communities (Innes and Booher, 2003)?

Notes

[1] The Front Range Fuels Treatment Partnership is an interagency wildland fire communications group (http://www.rockymountainwildlandfire.info/frftp.htm). It is comprised of a leadership team of upper-level administrators, a steering committee, and a public relations committee comprised of natural resource, management agency personnel from the Colorado State Forest Service, The USDA Forest Service, the USDI National Park Service, the USDA Forest Service Rocky Mountain Research Station, and the USDI Bureau of Land Management in the Front Range of Colorado. The Partnership sponsors a Roundtable with a mission to serve as a focal point for diverse stakeholder input into the Partnerships efforts to reduce wildland fire risks through sustained fuels treatment along the Colorado Front Range (FRFTP, 2004).

[2] The wildland-urban interface (WUI) has been defined as a zone where substantial human occupancy coexists with areas of flammable forest, brush, and grassland vegetation. This zone can include primary residences, vacation homes, mobile homes, commercial buildings, and outdoor recreation facilities. The principal characteristic of the interface zone is the intermixing of people, houses and developments, and natural vegetation, with an inherent risk to each from

wildfire (Chase, 1993, p. 350). Over 730,000 people live in the WUI along the Front Range of Colorado with over 30,000 resident homes in the Arapaho and Roosevelt National Forests alone (FRFTP, 2002).

[3]Social acceptability has been examined using belief-attitude-behavior models from social psychology (Brunson and Shindler, 2004). According to Brunson (1996, p. 12), "acceptability is a product of cognitive judgments" that reflects a person's attitude toward conditions and management practices in the interface. We hold that the concept of social acceptability often is oversimplified when measured as the average WUI resident's mental judgment of what is acceptable fire policy or management practice. Rather we see social acceptability as a dynamic process (Shindler and others, 2004) of relationship building and coming to mutual understandings without necessarily changing core values and beliefs about land management policies.

[4] Self-organized collective action is a dimension of *community capacity*—"the interaction of human capital, organizational resources, and social capital existing within a given community that can be leveraged to solve collective problems and improve or maintain the well-being of a given community" (Chaskin, 2001, p. 295).

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Appendix A. Preliminary list of themes with descriptions that emerged from the interviews and literature for the 2004 FRFTP study.

Capacity: Participants discuss what a community is capable of doing about mitigation and wildfire; institutional capacity in the form of regulations, zoning, expertise (human capital), experience and fire history in the place (cultural capital), mobilization of physical resources (social capital), etc.

> *Barriers to mitigation/meeting the current mission of the FRFTP*: Discussion of limits on efforts to mitigate fuels and get acres treated. (This is where our task of reframing the issue or the mission of FRFTP as one of community capacity is linked to barriers.)
>
> *Community leaders*: The role of community leaders relative to mitigation. The presence of leaders is an indicator of social capital.
>
> *Community networks*: Who's talking to whom within the community about wild fire? These networks are an indicator of social capital.

Collaboration: Discussion of the collaborative process, success stories, failures, relationship building, etc. (This is closely related to the theme of trust and relationship building.)

Communication: Participants discuss interaction with the government agencies, local authorities, WUI residents, etc. about fire, framing the issue, the problem; one-way versus two-way communication.

Criteria for Success: Discussions of what they are. What should they be? Acres treated versus communities enabled to treat. How do they differ by frame of reference?

Education I: Reported exposure to any materials dealing with wild fire education-traditional efforts to inform the public and enhance understanding. Participants discuss information dissemination.

Education II: Discussions of how people learned via other ways such as living through a fire or going to a community meeting or personally speaking with an agency representative or private manager about fuels mitigation projects in their area or collaborating in a group.

Forest Health/Restoration: Participants discuss the relationship between catastrophic fire and forest health. What does forest health mean to WUI residents compared to agency representatives? This is tied to our interest in multiple meanings, socially defined and debated nature, and public understandings of forest conditions and restoration.

Framing the Problem: Participants describe how they see the problem or how other see the problem. For example, people may talk about wildfire and fuels treatment projects in

the WUI as issues of public safety, forest health, restoration of wildlife habitat, community capacity, or a private land problem, etc.

> *Building and creating community capacity*: Enabling public stakeholders to better manage wildfire risk. Local governments need to invest in the WUI communities to show how mitigation projects can help to improve these communities.
>
> *Communication problem*: Information processing/attitude change route to communication compared to interactive two-way strategies.

Front Range Fuels Treatment Partnership Mission, Goals, and Objectives: When the intent, mission, or the goals and objectives or the roles of the FRFTP are specifically discussed or debated by interviewees. These may be the perceptions of the group or individual and may not reflect what members of the FRFTP state.

> *Roundtable purpose*: Discussions of the purpose, objectives, strategies, etc. of the FRFTP-sponsored Roundtable meetings. This is a sub-theme of the FRFTP Mission (see FRFTP, 2004).

Funding for Mitigation: Participants debate or discuss any confusions about where to get financial resources to fund mitigation projects and what to do with the vegetation after it is mitigated; how to obtain a chipper or landfill space; how and when or if to burn slash piles after mitigating property, etc.

Government Agency Trust and Building and Sustaining Relationships: Any discussion by participants of trust, attitudes, or observations about the local, state, or federal governments' or agencies' abilities to handle the wild fire problem or complete successful mitigation projects.

At a somewhat deeper level, collaboration has been described as building and sustaining interpersonal relationships. Participants discuss efforts to build inter-stakeholder relationships such as the FRFTP Roundtable meetings or other partnerships like PPWPP. Wondolleck & Yaffee (2000, p. 162) typified this theme in a discussion of successful collaborative relationships:

> "They are honest, sincere, compassionate, committed, understanding, respectful, and caring. Over time trust is demonstrated by the individuals in the relationship. Effective collaborative partnerships recognize the need to build and sustain productive relationships between those involved and take steps to establish those linkages."

Participants discuss attributes of successful collaboration as such and any processes of relationship building or communication that foster respect, honesty, trust, etc.

Interagency Cooperation: Discussion of agency efforts to cooperate about wildfire and fuels projects in the WUI; both successes and failures.

Media: Anytime participants discuss mediated communication about fire.

Newcomer vs. Longtime Resident: Discussions about of the effects of lack of experience with the WUI environment and wildfire versus lots of experience and history with wildfire based on long-term residence in the WUI. (We may break this down further, but early on this will include year-round resident, versus remote owners who may not be around much.)

> *Cultural capacity*: Discussions of communities as traditionally tied to the land in their occupations? Are they tolerant of land management in general?
>
> - *Fire history*: Participants discuss the history of a community regarding wildfire; does it burn every 10 years; every summer; do they rarely have wildfires? Fire history is a dimension of cultural capacity.

One-Size-Fits-All Approach: Discussions of efforts to find simple technical solutions for the complex problem of wildfire and fuels treatments in the WUI for example, not accounting for differing worldviews, capacities, needs, expectations of distinct communities. A prominent example is the use of standard FIREWISE home diagrams.

Understandings of Science: Anytime participants discuss or attempt to evoke science and its role in their discussion of wildfire and fuels reduction projects. Theme includes related discussions of the relationship between science and fire policy and public understanding of science. What are the limits to both social and natural science for this problem?

Appendix B. Front Range stakeholders identified in the 2004 FRFTP study.

Interest	Interviewed	Roundtable
Interface homeowners' associations	yes	
Citizen's watershed coalitions	yes	
Other wildfire prevention partnerships	yes	
Volunteer fire departments	yes	
Conservation ecologists from NGOs*	yes	yes
Federal and state agency administrators*	yes	yes
Journalists from the media	yes	
Eastern plains citizens	yes	
County, state, federal project level workers	yes	
Academic community*	yes	yes
Urban citizens		
Local government and county officials*		yes
City water boards		
Wildland fire fighters		
Public forest recreation clubs		
Forestry industry/commercial businesses*		yes
Insurance companies		
Local chambers of commerce		
Public schools		

Note: Groups marked with asterisks are broad categories of stakeholders that the FRFTP, conservation NGOs, and community partnerships have identified as key groups to initially invite to the ongoing, FRFTP-sponsored Roundtable meetings (FRFTP, 2004).