IS SMOKEY OBSOLETE? SYMBOLIC MEANINGS OF WILDLAND FIRE

AND COMMUNICATION IN THE MINDS OF

WILDLAND-URBAN INTERFACE RESIDENTS

By

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Abstract

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This two-part study uses symbolic interactionism as a basis for understanding the
fundamental meanings of wildland fire and fire communications to wildland-urban interface
residents. There is a well-documented tendency in the social-psychological and communication
literature for communicators to assume that an audience shares the same basic assumptions and
terms of reference about the subject being considered. The recent history of U.S. public land
management, its relations with the public and its many discontents is rife with examples in which
such assumptions turned out to be mistaken. The first part of this study contributes to an
understanding of how residents of the WUI actually view wildland fire, its role in forests
ecosystems and its attendant risks for human settlements. A second section applies this
knowledge to explore residents' views of wildland fire communications and agency effectiveness
in collaborating in the new era of fire inclusion. Three focus groups were conducted with
residents of the wildland-urbane interface near Spokane, Washington. Results from the first
paper indicate a high level of salience of wildland fire to participants' daily lives and significant
concern about the risk of fire events in their residential areas. Participants were generally quite
aware of the additional fire risk in the WUI and recognized the added responsibility WUI
residents face in terms of fire preparedness, though few were able to identify the exact

terminology or personal protective strategies widely used by fire professionals. Results from the second study indicate that residents get the majority of their information from personal sources or the Internet and that they desire face-to-face, two-way interaction with fire managers about defensible space and fire policy. Participants displayed poor ratings of communication effectiveness and access to fire information, which contributes to lacking trust in management agencies. Smokey Bear received resounding support as a continued symbol of federal fire management, but in participants' view, the symbol needs expanded meaning coincident with the new era of fire management and local resident responsibility. Each study section concludes with suggestions for fire managers and a final chapter addresses the theoretical links between the studies.

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Chapter 1: Introduction to Research

Approximately 96,385 fires burned about 9,873, 429 acres of American land during 2006, setting new records of fire prevalence and continuing a steady increase since 2000. The 2006 fire season also was the latest in a series of severe fire years exceeding federal spending beyond $1 billion (National Interagency Coordination Center, 2006) and the continuation of a dramatic increase in wildland fire that managers expect to increase for at least 40 more years.

Much of the wildland fire research during the past 10 years focuses on those living adjacent to or near public lands, and with good reason (Winter, Vogt & McCaffery, 2004; Winter, Vogt & Fried, 2002). Research shows these populations are those most at risk from fire and can aid agencies in keeping fire size small through the implementation of defensible space (Calkin, Gebert, Jones & Neilson, 2005). What is problematic are the ways ever-changing societal dynamics such as the increasing number of landowners living near public lands or their views about the role of fire will continue to influence management of the hazard (Kumagai, Carroll & Cohn, 2004). The traditional view of "fighting" fire established at the start of the last century is no longer as easy as it once was; it is now an intersection of social science and land management because of homeowners whose backyard was once the backcountry.

Americans living further from cities and closer to public lands, what is called the Wildland-Urban Interface, are at the heart of the move to reintroduce fire to forest ecosystems, though few who occupy its boundaries are absolutely clear as to what this entails (Loomis, Bair, Gonzalez-Caban, 2001; Parkinson, Force & Smith, 2003). Land management agencies charged with "controlling" fire have a long history of communicating information on and the shift toward fire inclusion, however it appears that understanding what these efforts means to those living in the WUI requires more in-depth study of the processes involved (McCaffery, 2004; Bergman &

Bliss, 2004; Toman, Shindler & Brunson, 2006). It is only through mutual understanding and reciprocal communication that managers and the public can make proactive efforts to lessen what continues to be a salient threat to a large number of American citizens.

This chapter will outline the need for research on social concerns associated with wildland fire and communication practices associated with its management. I first provide a background of wildland fire policy in America. A second section will outline how additional efforts toward fire policy and management should combine aspects of risk communication and sociological theory. Included in this discussion is the role of stakeholder communication in managing a public resource. I will then provide an argument for using sociological theory to understand public knowledge of fire management and design communication programs to garner public support.

These studies focus on U.S. Forest Service policy and management as it is the primary government agency dealing with wildfire mitigation and management. The Forest Service receives the majority of government funding for wildland fire management and employs the greatest number of personnel as wildland firefighters (National Fire Plan, 1995; USDA and USDOI, 2003). It also developed the Incident Command System U.S. agencies use to mitigate natural disasters and controls a larger amount of U.S. land than any other land management agency. The Forest Service is a logical practical choice for these studies because its policies play a crucial historical role in the establishment of fire conditions now threatening U.S. citizens; though this study easily could apply to any agency managing land near private homeowners.

A secondary interest in the Forest Service stems from its unique organizational change during the past half a century. As Kaufman (2006) indicated in his study of forest rangers, the Forest Service implemented an extremely effective protocol of socialization and administrative

behavior for its personnel. The result was effective bureaucratic management and public support for the agency during for much of the 20th century. Yet Kaufman also warned that the Forest Service would have trouble navigating social change due to the rigidity of their organizational structures, and fire represents one of many changes the Forest Service has had trouble adapting to. The result is a lack of trust and identification in an agency which once enjoyed both (Winter, et. al., 2004; Winter et. al, 2002). Social concerns such as trust bridge the gap between policy and communication and necessitate studies stemming from a latter discipline.

This research combines aspects of risk communication, symbolic interaction and social constructionism to address the Forest Service's organizational change toward fire and how affected communities understand these plans. My purpose in these studies is to outline how communication between stakeholders involved in fire can help manage perceived conflict over fire policy and garner public support of Forest Service management on government land.
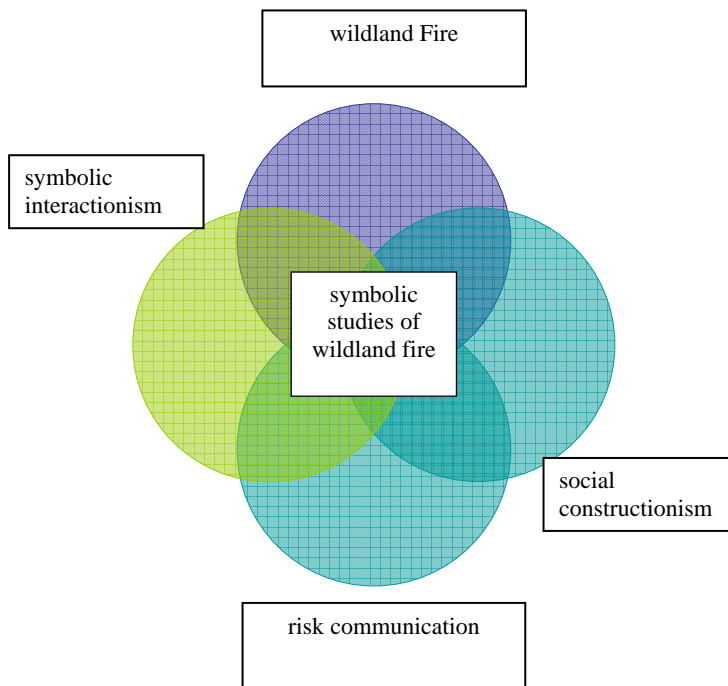

Figure 1: Conceptual Cusp of Research

Conflict about fire often stems from a lack of understanding between stakeholders. In Chapter 2, I gauge the levels of understanding and meaning the public have about fire. Given this symbolic terrain, I address specific communication strategies for implementation in Chapter 3. Through these two foci, I will provide preliminary recommendations on the type of communication needed to convey new fire management strategies of the Forest Service and other land management agencies. Another goal is to provide insights in the relationship between the public and the land management entities in the Spokane, Washington, area.

Research Conceptualization

The remainder of this chapter introduces the disciplines and literatures contributing to the study of wildland fire. I will begin with an overview of fire policy in America to highlight the recent reemergence of wildland fire as a significant disaster event and to discuss historical difficulties with its management. This also includes the evolution of firefighting policy and the shift toward its reintroduction by agencies as a management tool.

The next section will introduce the sociological basis of fire management by explaining how private landowners influence fire management and mitigation. This will include a historical overview of agency efforts to educate the public about fire policy and the effects fire events have on community functioning or interactions with management agencies. I will introduce public knowledge of fire as an important factor in the development of social theories related to fire.

Another section will introduce risk communication and discuss its applicability to wildland fire. I contend that risk communication can help manage conflict between WUI residents and management agencies by increasing community involvement and preparedness for catastrophic wildfire situations that threaten homes. Included in this discussion is the move

toward two-way conceptions of risk communication that seek feedback and active participation from the public in agency management.

My next section will begin to justify the use of symbolic interactionism in these fire studies as they provide everyday meanings for fire. I contend that these meanings precede value judgments or opinions about fire and are a crucial component in developing communication strategies about fire management. A final section will outline the following chapters of this thesis.

A Synopsis of Fire Policy

American Forests experience wildfire in a cyclical pattern. Just as recent years include a dramatic increase in wildfires across the American West, a number of catastrophic fires also plagued America during the late 1800s and early 1900s. The Peshtigo, Wisconsin, fire of 1871 killed 1,300 and charred more than one million acres, while other fires such as the Yacolt Burn in Washington State killed about 38 people and burned 238, 920 acres. Yet it was "big blowup" of 1910 that Pyne, Andrew and Laven (1996) cite as the catalyst for the most important policy decisions of wildfire management. About 86 people, mostly firefighters, died in the 1910 fires of western Montana and Idaho. It destroyed three million acres of timber. The event caused managers to realize that the fledgling Forest Service did not have the resources or amount of employees to combat the growing threat of wildland fire to citizens in rural areas (Pyne, 2000). The response was a 100 percent fire suppression policy which effectively removed fire from the ecosystem of American Forests (USDA Forest Service & USDOI, 2000).

Though Pyne (1996) reports earlier attempts, the U.S. Forest Service did not begin revising its policy of 100 percent wildfire suppression until the 1970s (Stankey, 1976). Fire scientists began to realize that periodic fires created habitat for wildlife by periodically

modifying the plant composition of the forests and clearing out brush (Gardner, Cortner & Widaman, 1987; National Fire Report, 2000). Some species of trees such as the Ponderosa Pine need fire to drop their seeds and its the removal changed forest composition in large portions of the Midwest and East Coast (Brose, Schuler, Van Lear & Berst, 2001; Ruffner & Groninger, 2006). Suppression also facilitated the build-up of fire fuel in the form of dead trees, underbrush and shrubs. While periodic fires reduced these fuels and limited the amount of large fires, suppression allowed the build-up to threaten an even greater number of residents in diverse areas.

The Forest Service now advocates letting fire resume its natural role in the ecosystem and its introduction to certain areas in order to manage plant compositions (National Fire Report, 2005; USDI and USDA 1995). However, fire exclusion still factors into management strategies where it threatens private land or is the result of excess fuels rather than a natural cycle of fire in the forest. The problem now is that a growing number of private citizens have moved closer to public lands, forcing new management strategies that must take into account the needs or private landowners. For this reason, any fire policy must take into account the human impact of fire management and attempt to include these stakeholders in the process. It is this process I turn to next.

The sociology of wildland fire

Fire exclusion and the move to reintroduce fire to American lands are social concerns as much as they are scientific ones. Efforts to eliminate the danger of fire are a form of rationalization, what Weber (1970) described as the human attempt to master the natural world with calculation and science. Carroll, Higgins, Cohn & Burchfield (2006) indicate that rationalization extends to the bureaucratic management of wildland fire and that the Incident

Command Response model rigidly adheres to science over human considerations. The result is often social conflict between incident response managers trying to put out the fire and private landowners threatened by it.

Though there is little research on wildfire as a source of social conflict (Carroll, Cohn, Seesholtz & Higgins, 2005), research on other disasters indicates disruptions can create social cohesion or conflict (Quarentelli & Dynes 1976; Cuthbertson and Nigg, 1987). Georg Simmel was among the first to acknowledge that groups tend to increase their cohesion when faced with an outside threat (Coser, 1956) while and others such as Cuthberson and Nigg (1987) have extended his hypothesis to show how residents band together in the face of adversity. Primary to this distinction is whether the disaster is natural (flood, hurricane, and tornado) or created by human (technological) means. The latter tends to create conflict by providing appropriate human agents to blame for some failure leading to the catastrophe while natural disasters are often the site of community support because they are outside of any agents' control (Quarentelli & Dynes, 1976). Wildfire is unique in that it can be either a natural or technological disaster based on management of the area or cause of the fire (Carroll et al, 2005; McCaffery, 2004).

Public opinions about wildfire policy are vital to avoiding social conflict and maintaining effective public land management (Hall, 1972). This is especially true of Forest Service efforts to manage fire because the agency promotes multiple uses of public resources in the interest of the American people (Forest Service Web site, 2006).

Public support for wildfire exclusion was a logical conclusion following the devastating fires of the early 1900s and few questioned its enactment (Pyne, 1997). However, fire exclusion gained its most enduring symbol in 1944 with the introduction of Smokey Bear and his message of preventing forest fires. Though originally intended to prevent only human-caused fires in the

forest, Smokey soon came to represent the suppression of all fire. He is arguably the most successful public information campaign ever created (Smokey Bear Web site, 2006).

Efforts to change public perceptions of fire and alleviate their fears regarding the new fire management paradigm have proven difficult to change (Calkin et al., 2005; Parkinson et al., 2003). More than 70 years of advocating fire suppression and Smokey's ingrained message created negative connotations of fire in the minds of the general public. The need for increased understanding of fire management is imperative as urban sprawl pushes homeowners closer to public lands. Often called the wildland-urban interface (WUI), residents living near or adjacent to public lands face added dangers when forest managers allow fires to burn on public land (Hesseln, 2001; Winter et al., 2002). It is crucial for management agencies to work with WUI residents due to their vulnerability, however added threat to these residents' property often creates conflict or confusion when residents do not understand the management strategies employed to protect them (Carroll et al., 2005; Schneider 2002; Rakow et al., 2003).

Studies during the past 30 years show increases in public knowledge of wildland fire mitigation strategies (Cortner, Zwolinski, Carpenter & Taylor, 1984; Manfredo, Fishbein, Hass & Watson, 1990; Loomis et al., 2001). While this trend is beneficial step toward the use of management strategies such as purposely set fires or manual removal of underbrush, the prevalence of NIMBY groups, resistance to prescribed burning and a lack of trust in management agencies seemingly undercut some of these positive gains (Winter et al., 2004).

Knowledge and Wildland Fire

Wildland-Urban Interface residents are a diverse collection of individuals with different levels of knowledge and support for fire management. These trends not only vary among communities, but in geographical regions across the United States (Brunson & Shindler, 2004;

Kneeshaw, Vaske, Bright & Absher, 2004). Researchers take this into account while attempting

to create uniform understanding and agreement on Forest Service management. As Daniels

(2000) has noted, the era of fire management requires more trust and effective communication

between the public and land management agencies than during the era of fire suppression. This is

especially important to fire management in the wildland-urban interface because of the inherent

interactions private landowners will have with management agencies and the extra precautions

they need to protect their property. Fire inclusion requires all landowners manage their property

uniformly and be aware of fire danger in order to reduce catastrophic events.

Risk Communication and Wildland Fire

Forest Service attempts to communicate with affected publics about wildland fire

inherently involves the concept of risk and the uncertainty of action that comes with it. Yet a

number of studies show that experts and the general public view risk and uncertainty associated

with disasters in fundamentally different ways, often creating barriers to in collaboration or

communication (Donahue, 2004; Frewer & Hunt, 2001). The current study explores efforts to

integrate stakeholders into management processes integrating risk communication literature. This

insight will be useful in the evaluation of best-practices and strategies involved in inform private

landowners and prompt them toward civic engagement.

Effective risk communication can create greater community involvement, preparedness

and organization to reduce the potential for catastrophic damage in wildfire situations (Heath &

Palenchar, 2000; Pearce, 2003). A number of studies also indicate those who are more

knowledgeable of wildfire management strategies and its benefit to the forest are often more

likely to support management action (Cortner et al., 1990; Carpenter et al., 1986; Loomis et al.,

2001). Risk communication researchers have long documented the influence additional

information has in reducing losses from disasters, most notably hurricanes and industrial spills (Lindell & Whitney, 2000; Pearce, 2003; Cova, 2005; Faupe et al., 1992). Additional interaction between management teams, aid distribution agencies and communities involved in disaster also can lessen conflict and increase trust by creating common standards of aid and understanding of management strategies (McDaniels et al., 1999).

Risk communication about fire includes justification and understanding of how fire benefits the ecosystem, options for protecting stakeholder homes, and site-specific information on the danger of severe burns. Plans to introduce fire to nearby public lands are another consideration. Though these efforts should include common disaster concerns such as private property rights, they also incorporate unique aspects such as the fear of escaped burns set by the Forest Service or the modification of public lands homeowners value (Winter et al., 2002). Exacerbating the challenge of communicating fire risk and responsibility are residual Smokey Bear heuristics and the excess fuels established during more than seven decades of strict fire suppression (Pyne, 1997; Hesseln, 2001).

Forest Service attempts to increase stakeholder involvement include the shift to an open model of communication. The traditional protocol of risk communication often overlooked the specialized input residents could provide in the management process by creating a one-way flow of information from experts to the public (Heath & Gay, 1997; Gurabardhi, Gutteling & Kuttschreuter, 2005). The Forest Service's move toward two-way communication models advocating public comment in the planning process are replacing these old forms of risk communication (Hance, Chess & Sandman, 1989; Gurabardhi et al., 2005).

Despite progress toward two-way models of communication in fire literature (Parkinson et al., 2003; McCaffery, 2004), the need for additional efforts to increase communication

between the Forest Service and the public are essential in reducing experts predictions of devastating future wildfires. Allowing private homeowners' a role in the management process and acknowledging their concerns about setting fires as a management tool have the capacity to build previously discussed trust relationships between the public and the U.S. Forest Service (Winter et al. 2004; Shindler & Toman, 2003). A lack of trust between these stakeholders could create barriers to acceptance and effective implementation of the new fire management paradigm.

<div align="center">*Symbolic Interactionism and Wildland Fire*</div>

These studies recognize that researchers must first recognize the knowledge, understanding and meanings residents have for wildland fire before addressing its support or management. This includes the salience of wildfire to residents' daily lives and whether or not they understand the considerations unique to their area. When paired with their opinions about fire exclusion, the "meanings" residents have of wildland fire serve as a basis to create involvement programs or garner support for wildland fire management (McCaffrey, 2004). Knowledge of stakeholder perceptions also can help professionals understand what aspects to focus on in communication programs attempting to garner public support (Zaksek & Arvai, 2004; McDaniels et al., 1999).

Residents' perceptions of Forest Service personnel and their perceived competence also precede risk communication by gauging what barriers to collaboration exist. This includes the effectiveness of existing communication programs by the agency and the need for additional efforts. These perceptions factor directly into issues of trust between the public and the Forest Service and can negate efforts to increase support for wildland fire policies. At the heart of these

perceptions is the public's belief that the Forest Service's can adapt to new management strategies or whether it is locked into the traditional fire exclusion paradigm.

I maintain that using the sociological concept of symbolic interactionism provides a useful way to gauge stakeholders' "meanings" surrounding wildland fire and the U.S. Forest Service (Blumer, 1969). Symbolic interactionism maintains that humans act toward issues on the basis of the meanings they have toward them and integrates the inherent role symbols such as Smokey the Bear play in this process. (Blumer, 2000). As a secondary consideration, symbolic interactionism can explain how communication with others social actors about natural resource issues can influence their perceptions about them. To this end I also introduce the associated communication theory of social constructionism, which implicates the role of communication in creating knowledge about a subject. Knowledge of the processes leading to resident conception about fire is integral in stakeholder interaction as they continually modify management plans based upon agreement (Heath & Palenchar, 2000; Reynolds & Seeger, 2005). My approach in these studies differs from others because it attempts to understand how shifting meanings of fire can facilitate supportive behaviors rather than change attitudes. Open communication with Forest Service personnel or private homeowners' adoption of individual fire defenses are two of such behaviors.

Research Design

Section 1 of this two-part study uses symbolic interactionism to illustrate residents' existing salience and meanings for wildland fire in the wildland-urban interface and more rural areas. It also uncovers some resident meanings surrounding firefighting efforts and knowledge of fire management. These perceptions are the basis for any structured communication or collaboration about fire management or the Forest Service's new paradigm of fire inclusion. I

use focus groups with wildland-urban interface residents living near Spokane, Washington, as focus groups are the best way to judge residents meanings behind these concepts and allow for elaboration to mediated questions of interest.

After gauging existing attitudes and knowledge levels about wildland fire, section 2 explores residents' perceptions of Forest Service communication with WUI homeowners. This includes the effectiveness of existing communication about fire and what forms of additional interaction could increase civic participation surrounding wildfire policy and decision making. It also addresses the viability of the Smokey Bear symbol and whether it has the ability to carry the new fire management strategies of the Forest Service.

This approach will provide preliminary recommendations for the levels and type of communication the Forest Service needs to convey fire management and risk to members of the Wildland-Urban Interface. Included in these measures are communication strategies designed to increase the salience of wildland fire and provide the basis for civic engagement in fire management.

Chapter 2: Meanings of Wildland Fire

Increases in the size and intensity of wildland fires along with continued expansion of human settlement into the wildland-urban interface has led to renewed calls for changes in fire management strategies on public forests, particularly those proximate to residential areas (McCool, Burchfield, Williams & Carroll, 2006). These events and particularly the threat of wildland fire to people and homes in the WUI have spawned debate over where the responsibility of forest managers ends and where that of homeowners, neighborhood associations and local governments begin in terms of protecting human infrastructure from the threat of wildfire (Shindler & Toman, 2003; USDA & USDI, 2000). Further complicating the issue is the evolution of scientific thinking concerning the ecological role of fire in forested ecosystems. It is now widely accepted in scientific circles and among at least some public advocacy groups that fire is a natural part of wildland ecosystems and that efforts to achieve the long-held goal of complete fire exclusion have paradoxically led to greater risk of unnatural "catastrophic" fires posing risks for human settlements and forests.

Coincident with the above-noted changes is a shift in resource management agencies and policy maker's messages to the public surrounding the question of appropriate citizen actions relative to wildland fire risk. The old message symbolized by the famous Smokey Bear campaign was quite simple: do nothing to ignite uncontrolled fires and do everything possible (such as care with campfires and the timely reporting of small fires) to enable the quick suppression of any such fires by the trusted, trained professionals who managed the public estate. But now the message is both more complicated and more demanding: some fires are "good"; prescribed fires can help prevent catastrophic ones; and the public (particularly that portion of it living in the WUI) have a role to play in mitigating fire risk. Perhaps most importantly (and problematically)

the new message calls for actions on the part of WUI residents to act in advance of fire events to defend their homes and communities against fire risk.

Sending a new message about the function of fire in forest ecosystems is a difficult endeavor, especially when it includes a more proactive role of the citizenry affected (Martin, 1995; Beebe & Omi, 1993). Forest managers recognized the detrimental effects of universal fire exclusion policies as early as the 1970s, yet progress in broadening public knowledge, even on that point have been slow. A recent increase of catastrophic fires in the American West as a result of fuel accumulation, climate change and other factors has added to the urgency of the need to get the new message out (Calkin, Gerbert, Jones & Neilson, 2005; Winter et al., 2002; Kneeshaw et al., 2004). More than 8.5 million acres burned in 2005 due to wildfire, the latest in a series of severe fire seasons exceeding federal spending beyond $1 billion (most notably, 2000, 2002) (National Interagency Coordination Center, 2006).

On the matter of the need for more citizen action with respect to fire risk, studies during the past 30 years show increases in public knowledge of wildland fire mitigation strategies and severity of the danger (Cortner, Zwolinski, Carpenter & Taylor, 1984; Manfredo et al., 1990; Loomis et al., 2001). While this trend is beneficial step in a number of management strategies such as prescribed burning or mechanized thinning (to imitate the effects of fire where it is too risky to burn), the prevalence of NIMBY groups, resistance to prescribed burning and a lack of trust in management agencies seemingly blunted some of these gains (Winter et al., 2004). Newer studies have focused on homeowners living in or near the WUI. These populations are those most at risk to wildland fire, the most likely to have interaction with land management agencies about fire management and the ones from whom the most is being asked in terms of citizen actions to mitigate fire risk to residential areas.

There is a well-documented tendency in the social-psychological and communication literature (Frewer & Hunt, 2003; Hibbard & Lurie, 2000) for communicators to assume an audience who shares the same basic assumptions and terms of reference about the matter being considered. The recent history of U.S. public land management and its many discontents is rife with examples in which this assumption turned out to be mistaken (Raymond, 2003; Flint & Luloff, 2005; Rakow et al., 2003). Thus the focus of this study is to contribute to an understanding of how residents of the WUI actually view wildland fire, its role in forests ecosystems and its attendant risks for human settlements. Because the views of citizens concerning the public agencies charged with managing wildland fire outside residential areas is highly likely to be tied to their perceptions of risk from wildland fire, their views of such agencies as fire managers will be a focus as well.

Specifically, this study applies a theoretical perspective from sociology known as symbolic interactionism to focus groups of wildand-urban residents to better understand the salience and meanings WUI residents associate with wildland fire, the risk that it poses to residential areas, and its management by agencies such as the U.S. Forest Service. Understanding the meaning and salience of fire risk to WUI residents' lives, the details of their fire-related knowledge and perceived risk is crucial in developing and communicating fire-related policies and actions which require their support and cooperation.

The balance of the paper will be organized as follows: First we will review some relevant literature on WUI residents' changing views regarding wildland fire and then discuss the basic tenants of symbolic interactionism as it is applied in this particular case. Next we will summarize the results of the focus group sessions followed by a discussion of their relevance for developing more effective approaches for dealing with the public on WUI fire risk.

Literature Review

A number of contextual elements and experience of stakeholders involved contribute to public views of any natural resource issue (Vaske, Donnelly, Williams & Jonker, 2001). Factors contributing to the context around the current wildfire situation include fear of escaped fires (Daniel, 1988), costs for suppression (Winter et al. 2002), and the adverse effects wildland fire may have on recreational opportunities or area aesthetics. Other studies show geographical area, proximity to homeowners (Brunson & Shindler, 2004), and the origin of the fire also play a role in people's views (Kneeshaw et al., 2004). Of special importance to recent mitigation efforts are (typically low) trust in management organizations attempting to control wildland fire (Winter et al. 2004), previous experiences with fire (Jacobson, Monroe & Marynowski, 2000), fire size (Carpenter et al., 1986) and residents understanding of fire benefits such as nutrient recycling (Loomis et al., 2001; Cortner et al., 1984). In response to a perceived lack of trust or relationship between the public and the management agencies such as the U.S. Forest Service, scholars are developing a variety of programs to educate and inform the public about wildfire issues (McCaffrey, 2004; Zaksek & Arvai, 2004).

Significant, organized effort to suppress wildland fire in U.S. forests began after the devastating 1910 fires (Pyne, 2001). The subsequent half century of suppression activities persisted in influencing public attitudes until the early '70s, when Hall (1972) found the majority of the public believed all forest fires were bad (Pyne, 1997). The centerpiece of the public campaign for fires exclusion was the highly successful symbol of Smokey Bear (Hesseln, 2001). However, studies beginning in the 1970s were the first to demonstrate the public's willingness to support alternative strategies for fire and led to increased focus on allowing fire in the forest, specifically wilderness areas (Cortner et al., 1990).

Public Support of Fire Management

A growing body of literature exists on the public's acceptance of prescribed fire and other management strategies, although only a handful of studies have focused explicitly on the wildland-urban interface. These studies focus primarily on issues such as smoke, perceived risk and trust in management agencies, yet carry inherent insight into public understanding of fire as a natural phenomenon and its role in the forest (Wesshaupt, Carroll, Blatner, Robinson & Jakes, 2005; Winter & Cvetkovich, 2003).

Increases in support for alternative fuel management led to additional studies of public attitudes toward fire, specifically the role of informational campaigns on the natural role of fire in the forest (Carpenter et al., 1986; Manfredo et al., 1990). Cortner et al. (1984) found the Arizona residents had a much more sophisticated understanding of wildland fire benefit and fire management practices than previously assumed and Carpenter et al. (1986) demonstrated that the public could recognize beneficial or harmful fire situations. More recently, a study by Loomis et al. (2001) found educational programs increased fire knowledge and attitudes toward prescribed burning, although initial differences in knowledge were present. Similar increases appeared in attitude appeared in Manfredo et al.'s (1990) telephone surveys following the Yellowstone fires of 1988.

Though these studies provide evidence of increased public understanding or support surrounding wildfire and its management, others show it is not uniform across America (Brunson & Shindler, 2004). For example, residents in one segment of the country may advocate thinning over prescribed burning, while others may criticize thinning as a convenient excuse to log (Shindler & Toman 2003; Winter & Fried, 2000; Weible, Sabatier & Nechodom, 2005). Daniel, Meitner and Weidermann (1994) found many urban dwellers do not understand the dangers of

wildland fire and even if they do, may be unwilling to compromise their idealized perception of natural beauty for the interventions necessary to reduce the risk. Even in the wildland-urban interface, Gardner et al. (1987) found residents' generally unreceptive to wildfire mitigation programs due to low awareness (at that time) of fire severity and occurrence.

Although differences in geographical areas do play a part in acceptability, Kneeshaw et al. (2004) demonstrated geographic commonalities among regions by proving that survey respondents' normative beliefs remained constant in three geographical areas despite differences in specific scenarios. This demonstrates that while site-specific context plays a large part in decision making regarding wildland fire, knowledge and attitudes surrounding fire management are increasing.

Negative attitudes toward fire also can result from media exposure, which tends to exemplify catastrophic fires, death and destruction of homes (Jacobson et al., 2001). In this respect, the media is a crucial aspect of how the public perceives wildfires because those without personal knowledge draw their attitudes from what they see on TV or read in the newspaper (Smith, 1993; McCombs et al., 1999).

Fire in the WUI

More recent studies of wildland fire shift focus to homeowners in the wildland-urban interface and their perceptions of fire and management strategies. Shindler and Reed (1996) and Winter et al. (2002) found issues of economy, input and sustainable forestry were important aspects in acceptance of management practices. Other studies indicate increased understanding and visible results are needed to continue increases in public support for wildfire management and reduce negative ratings of land management agencies (Shindler & Toman, 2003).

Winter & Fried (2000) were among the first to acknowledge the lack of understanding about WUI residents conceptions of fire and management. What little research has been conducted about this population indicates their growing experience with wildland fire leaves them more apt to view fire as a natural part of many forested ecosystems that is negatively impacted by long-term suppression activities or preventative measures by any governmental agency (Winter et al., 2004). WUI residents apparently assess the acceptability of fuel treatments based on context of the situation and site-specific considerations, including social characteristics of the population and management agencies' perceived ability to communicate management strategies, professional skill and credibility (Winter et al., 2002; Brunson & Shindler, 2004).

Trust also factors into acceptability of fuel management strategies in different communities and can be based on personal interaction with employees of land management agencies (Winter et al., 2004). Damage to agency competency can occur in the instance of escaped prescribed burns which damage surrounding communities. Escaped fires also can negatively impact residents' attitudes toward prescribed burning, though the extent to which it negates future burns can vary based on the context (Brunson & Evans, 2005).

Collaborative Management of Fire

Integrating private homeowners' into the management process and acknowledging their concerns about fire has the capacity to increase trust between the public and land management agencies while advancing fire management (Winter et al., 2004; Shindler & Toman, 2003). Collaborative management can reduce conflicts about public safety by informing residents' about defensible space requirements and educating them about the precautions taken during prescribed burns (Casey, 1994; McDaniels et. al., 1999). In turn, private homeowners' can express concerns about management near their homes or provide agencies with local expertise

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about the resource (Payton, Fulton & Anderson, 2005; Wondolleck & Yaffee, 2000). The end result is a uniform level of knowledge and commitment to management among all stakeholders involved, increased acceptance of fuel-reduction efforts and successful fire management (Koontz et al., 2004; Frentz et al., 2000).

The most notable efforts for collaborative management about fire are the multi-agency FireWise Community Program and recent studies evaluating the best ways to educate homeowners about fire defenses (Parkinson et al., 2003; McCaffrey, 2004). The FireWise program is designed to foster responsible fire management and defenses among communities in the WUI through education and planning. Though FireWise and education efforts are proving to be an effective tools in educating WUI residents about fire dangers, a number of studies imply that residents feel agencies are not attempting or achieving collaborative efforts with the public on fire management (Winter et al., 2002; Brunson & Shindler, 2004).

Symbolic Interactionism

This study uses Blumer's (1969) symbolic interactionist approach to understand the views of wildland-urban interface residents regarding wildland fire communication efforts and management strategies. It places focus specifically on meanings and frames of reference held by study participants concerning (in this case) wildland fire as a source of risk to the WUI, communication efforts by management agencies concerning risks and appropriate management actions by agencies and local citizens.

Symbolic interaction views humans as pragmatic actors who create and modify the meanings of salient objects in their world (Blumer, 2000). Thus, human actors' communication and the meanings they have for salient objects become a central focus. This differs from

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traditional disciplines such as psychology which Blumer (1969) believed focused too intently on

behavior as a product of decision making.

Three underlying tenants guide Blumer's (1969) classic conception of symbolic

interactionism. It states human beings act toward objects, defined as anything indicated or

referred to, on the basis of the meanings they have toward them. The second premise implicates

the process of interaction between people as the source of these meanings. Thus, *shared*

meanings evolve as people interact with each other in relation to salient objects (Mead, 1934).

This places primacy on the interaction or communication between people rather than the vehicle

for sociological factors leading to behavior.

The third premise of symbolic interactionism states that individuals incorporate and

handle meanings through a process of communication and interpretation. Through this process,

actors establish what objects in the environment are salient and arrive at shared meanings for

such objects. These shared meanings in turn guide actions in the context at hand.

Of particular salience to the discussion at hand is symbolic interactionism's recognition

of the public as a collection of competing or conflicting interest groups and an often disinterested

or spectator-like citizenry (Blumer, 2000). The former group attempts to sway public opinion to

their cause and thus achieve social change (Blumer, 1970 in Lyman & Vidich, 2000), succeeding

only when the disinterested citizenry is able to engage in common dialogue or agreement with

their perspective. Similarly, Goffman's (1974) concept of frame analysis entails how people use

expectations derived from previous experience to make sense of their everyday life. These

expectations or preconceived notions about social events, controversies or daily activities

constitute each individual person's frame. Frames may differ given different geographical,

spatial or topical context and often help explain the variety of public conceptions on a broad topic such as wildland fire.

Newer models of issue evolution view these changes as socially constructed "distortions of enacted structure" in society (Lamertz et al., 2003; Stryker, 1980). The resulting failure of social order and mutually accepted rules leads to competition for a new structure and the inevitable adoption of a new standard for dealing with the objects in question (Weick, 1993; Goodin, 1998) According to Blumer (1962) this is part of the natural continuity of a mass society. The shift of focus in wildland fire management to include fuels management, the adoption of a view of fire as a natural and healthy part of ecosystems and a newfound belief that local residents bear responsibility for firesafeing can be taken as a examples of this process of societal change through symbolic interaction.

A small body of research applies symbolic interactionism to natural resource management (Thomas & Garkovich, 1994; Jorgensen & Stedman, 2001). For instance, Pregernig (2002) used a symbolic interactionist framework to describe how forestry professionals use interactions with others to form opinions on management strategies. Similarly Thomas and Garkovich (1994) used a social construction perspective to better understand how a cultural group developed meanings of nature and the conception of a particular landscape. Similarly, Carroll (1995) also used symbolic interactionism as a way of understanding the attachment of Northwestern loggers to their occupation and way of life and their disaffection for the "urban majority" who they believed were out to destroy both.

I believe this perspective will provide added insight concerning our understanding of WUI residents' knowledge, and frames of reference concerning wildland fire. Put in the language of symbolic interactionism, we focus on discerning the frames of reference and

meanings WUI residents have relative to wildfire rather than assuming they agree with those held by resource professionals.

Methods

According to Blumer (1969), any study using a symbolic interactionist approach should involve direct examination of the empirical social world. In this instance, focus groups seem an appropriate way to discover the salience of and meanings around fire held by WUI residents because it allows for open-ended questions and detailed explaination of views by participants. Focus groups also allow the opportunity for social interaction and the observation of how such dialouge influences participants' interpretations (Lindloft & Taylor, 2002). This method has advantages over surveys or one-on-one interviews in that it encourages participants to view alternative opinions and gives them the opportunity to work through questions to more fully express themselves and to convey their frames of reference on complex issues. Furthermore, it also allows insight on how context of group discussion modifies these conclusions (Krueger, 1994).

I made the decision to conduct the focus groups in the greater Spokane, Washington, area as that area has a relatively diverse rural population and has experienced its share of WUI fires, the most dramatic of which was a large wildfire that burned the area in 1991 and damaged 114 homes. A purposive sample of participants was recruited for this study and maps of the area were used, to identify possible wildland-urban interface residents. In drawing the sample, the focus group moderator drove to the location of each possible participant to ensure their proximity to public lands or inclusion as part of the WUI. This process is especially important because it ensured the participation of a variety of WUI residents. Once location of residence was confirmed a combination of door-to-door recruiting, doorknob hangers, and telephone directories

to find names on mailboxes were used to complete recruitment. Participants who were receptive to the project went through an additional screening process over the telephone to eliminate those with family ties to public forestry, wildland firefighting or forest product industries. While screening was used in the selection of WUI residents, no effort was made to distinguish residents by their educational background.

This procedure differs from previous attempts in that the moderator actually visited the site of residents to verify their inclusion in the wildland-urban interface. Traditionally, researchers contacted residents over the phone using reverse directories and asking a series of screening questions. This led to increased specificity in the sample selected, with some residents living adjacent to public lands and others closer to more manicured or urban environments. The effort of this study was to focus on those living near state or federal lands such as those management by the Forest Service, state parks or Bureau of Land Management rather than privately operated forested property such as golf courses and Christmas tree farms.

A total of three, 120-minute focus group sessions were conducted in the Spokane area in March 2006. Group size ranged from 10 to 13 participants. A professional focus group moderator led the discussions at specially designed focus group facilities. Sessions began with general questions regarding the area and quality of life and gradually narrowed to topics concerning the topics concerning fire in the forest, fuel management strategies, the role of management agencies and public involvement in preparing for fire hazards. Participants were told the focus group would concern management of public lands but not specifically informed of the topic of discussion. The moderator began sessions by explaining no outcome was expected and all opinions were welcome. He asked questions and then let discussion unfold between participants.

Results

Analysis of the focus group data revealed five significant themes related to participants meanings of wildland fire. These included the salience of fire in the daily lives of WUI residents; competing frames for fire when it is burning in the backcountry areas away from homes and when it is burning near homes in the WUI; participant knowledge and acceptance of fire in the forest; and their evaluations of firefighting efforts by agencies such as the U.S. Forest Service. These themes demonstrate the complexity of WUI residents' meanings for fire and provide a transitional view of their changing opinions. I will discuss each of these themes below in detail and provide examples of participants' views on the topics.

Salience of wildland fire

In order to gauge how prevalent fire is in the minds of participants, the focus group moderator asked what natural occurrence threatens them the most. Participants overwhelmingly listed fire, acknowledging their awareness of dangers inherent to the area. As one participant articulated, "I think about it (fire) at least once a day. I look outside and think what would happen if it were to burn." Another participant pointed out the impact of fire on surrounding landscape, "In our area, we have daily reminders. You see burnt trees every day. There's all kinds of stuff."

Participants indicated they most often think about fire seasonally, with though those making efforts to reduce possible fire damage indicating it is a year-round consideration. As one participant explained, "I think about (fire) monthly. July, August, September. It's on my mind when the dry lighting comes in, it might keep me a little awake at night."

It is important to note that wildland fire emerged fairly quickly and independently of any direct prompting in each of the focus groups. The moderator asked participants to describe their

land and public lands near them but made no mention of fire. Participants first mentioned fire while describing the areas they live in. As one resident said, "The land around where he and I both live is well-forested, except where the forest fires have come through over the last 15 years and burned them." Others outlined excess fuels and dangerous fire conditions near their homes. As one concerned homeowner said, "We spend a year and a half cleaning up our place just to (reduce) the fire hazard…" Others displayed concern for properties near their homes: "Just drive around, you'll see it all over the place. Boy, if you ever did get a bad fire in this country, and the weather's right, it will burn it all out."

Frame of Reference for Fire in the Non-WUI Forest

The focus group discussions clearly indicated that residents' frame of reference about fire has much to do with its proximity to the WUI. We observed across all three groups very different frames of reference concerning wildland fire when it was discussed in a backcountry context versus when it was talked about in proximity to homes and other human-created infrastructure.

One striking theme that emerged from the discussions was that participants' frames of reference for fire in the backcountry went well beyond the old Smokey message to include possible benefits from fire such as clearing excess brush and creating wildlife habitat. As one participant reported, "Some places, fire is beneficial. In some areas it really regenerates the forest." Some respondents (without any particular prompting from the moderator) described fire as something that should happen periodically:

> It's just a natural occurrence. Fire used to go unchecked for years before we civilized things. It always comes back. … Fire in the woods is also like she said, very scary. I'm not too afraid of it. I've got a great water source and a back-up generator. I'm well cleared around the area. My house is not going to burn.

A majority of participants reported positive meanings surrounding letting at least some fires in the non-WUI forest burn without human intervention. Some participants mentioned

reforestation and beneficial clearing of excess fuels when thinking about allowing fires to burn on a natural cycle. As one participant pointed out, "(After letting a fire burn) I envision the ground cleaned up and no more fuel down there to start another fire." Others implied this practice was particularly useful in areas that receive little human visitation or recreation. This is evident in the following participants' justification: "We weren't planning to use it in the first place. Maybe for the forest and the health of the forest, it is a good thing to let some of them (fires) go." However, letting some fires burn retained its positive association within the discussions only when private property remained far from harm.

The 1988 Yellowstone fires were a repeated example associated in the discussions with the beneficial nature of letting some fires burn in the backcountry. These three wildland fires eventually burned more than 800,000 acres of Yellowstone National Park. Though the fires were ignited by lightning, the events of that summer created an enduring debate surrounding the management of public lands and wildland fire. As one resident explained,

> I think of Yellowstone, where people though it was a holocaust and that nothing would ever grow again. You go back there now, and while there's still a lot of remnants of the fire, but the wildlife is greater than I've ever seen in my lifetime. The wildflowers have come back."

Participants also had positive associations with prescribed forest burning as a management tool in the non-WUI forest, though indications of support were dependent consistent in scenarios where the prescribed burn was not in close proximity to homes. As one resident said, "I think the reason they are doing these (prescribed burns) is to clean out the underbrush and to make it so if there is a fire … it will just hit and won't take off." Other participants stressed the need to keep a watchful eye on fires in case they grow to large proportions. As one participant indicated:

You don't want to go too far. I think there could be a map done of forest land and if the fire starts in an area, everybody around there knows the perimeters to let it burn that, the square … it wouldn't be a controlled burn, but it would be a safe burn.

Participants felt land management agencies have little duty to coordinate wildland firefighting efforts on private land and held that federal land management agencies should place primary emphasis on managing the forest, not protecting those who live near its boundaries. However, they stated that they would like to be included in the decision-making process if a fire on the national forest is threatens their home.

The majority of participants also advocated fire mitigation strategies such as backburns or letting some fires burn in the backcountry—even if the practice could impact private landowners. The focus group moderator gave residents a scenario of a fire burning on public land but threatening deeded private property where all animals and residents had been evacuated. Though some resisted, the majority of residents felt naturally occurring fires like this should be allowed to burn and human-caused fires suppressed. Those who initially resisted said the Forest Service should make reasonable efforts to protect private property while protecting resources using techniques such as backburns. Ultimately, residents agreed homeowners must accept the responsibility and dangers of living in fire-prone areas near National Forests. As one resident said, "I'm surrounded by a lot of private property with a lot of forest on it. If a fire starts and my house burns, well, I live in a forested area. I do my best to defend it, but things happen." Others stressed the choices homeowners make in deciding to move to the WUI: "If you are going to move out and be in that circumstance, you are taking that risk."

Frame of reference for fire in the WUI

Participants' frame of reference about fire in the WUI were strikingly different from those concerning fire outside of it. Discussions on this topic included more fearful language and

often-stated preferences for cautious use of fire as a management tool. Danger and possible damage were the initial responses participants associated with wildland fire in the WUI, and they were quick to mention the proximity of the fire to their homes and the possibility that it could affect them. As one participant explained,

> My first thought is that a couple of miles is not very far when the wind's blowing and it's in the trees, it jumps. My first thought was to just get home and get the kids out, because I live in the middle of the trees.

Events associated with fire in this context centered on fear of property loss or injury of loved ones and wind speed. Direction and smoke were other closely associated phenomenon. Another participant reported his reaction to a fire nearby: "You are worried about property and lives of people that are close to it, and how much it's going to burn, damage. And about the animals."

Ideas associated with fear and damage preceded any mention of letting fires burn or positive benefits and most participants believed management agencies should suppress all fires in close proximity to homes or those which threaten people.

Participants' frames of reference for fire in the WUI included images of defending their property and helping neighbors threatened by the fire. Participants on community wells expressed concern over the availability of water needed to protect their property during fire and others indicated they would help neighbors evacuate or establish defenses. As one participant said about a fire near his neighbor's property: "Do they need any help right away? If they can get to a fire right off the bat, they can stop it a lot of times."

Participants mentioned previous fires in the area as an example of the scope and severity of fire and its danger. One homeowner described his daily reminders of fire in the area:

> …assuming it was the same fire, probably '95, '96', it came right through my property. I probably have maybe 25 percent of the trees left that were on the property ten years ago.

Others burnt down and were logged. I'm still cleaning up the mess three years after buying the property.

Participants also mentioned the Yellowstone fires of 1988 as an example of fire severity and possible devastation when fires are allowed to burn in sensitive areas. These fires were a repeated topic associated with fear of fire and as one resident articulated: "The Yellowstone fire, didn't they pretty much drop the ball on that one, when they were going to let that, the let-it-burn idea with that?"

Some residents associated fuel management strategies and defensible space (though never explicitly using the latter term) in their narratives of fire. As one resident indicated, "I think about protectable space, green space or cleared space."

Defensible space emerged independently of direct questioning and participants described the strategies they take to alleviate concerns they have with living in forested areas. Participants described proper management or firefighting as the removal of excess brush around the home and reducing the occurrence of crown fires. As one resident reported:

> I think management, brush management, keep the brush cut down low, trim the trees up high, so that if there is a fire down here, it doesn't get up in the crowns of the trees. At least as much of a perimeter as you can get."

Participants could not agree among themselves on whether there should be legal requirements for homeowners to maintain defensible space. About half advocated requirements for those living in the wildland-urban interface while the other half said it should be optional. Defensible space received widespread support, but most believed no agency or governing body could force it on private homeowners. Many participants indicated homeowners in the WUI must protect themselves against fire if they expect outside help from agencies such as the Forest Service and that agencies should have no obligation to residents who do not take responsibility for maintaining defensible space. As one resident explained,

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We make a choice as to where we choose to live and to build, and we are pushing that boundary all the time. I really think it behooves us as private property owners to take that responsibility to have our piece of that nature in the best possible condition.

Participants indicated that residents of the WUI inherit responsibility in ensuring their land does not add to the potential danger of fire upon choosing to live in the WUI. Participants described this responsibility as a common courtesy to those living in the community:

I think you have to take responsibility. If I have the blessing of having 40, 10 or five acres like some of us have here; man, I'd be out there doing all kinds of stuff to make sure it didn't burn up I think we have some personal responsibility to take care of our own stuff.

Knowledge and Acceptance of Fire

Participants generally displayed an impressive knowledge of wildland fire and the risks or benefits associated with it. A majority of the focus group participants displayed relatively detailed knowledge of fire conditions and danger levels. Some participants knew the history of catastrophic fire in the American West and subsequent fire suppression policy by the Forest Service. Participants also were aware of the role of fire suppression in the creation of fuels now driving large wildfire events. Others cited recent Forest Service efforts to reintroduce fire into national forests. As one resident explained:

From what I read about it, it all started with the 1910 fire in the Silver Valley. This dramatic drive to suppress all fires … And these huge, huge fires we've had in Montana and Wyoming and Yellowstone, from what I've read, resulted from that suppression policy, resulting from the 1910 fire.

Participants also pointed out the ecosystem benefits associated with wildland fire. As one participant explained, "There are also benefits of burns. It clears the downfall, the dead stuff. Provides some sunlight to hit the ground and new growth, grasses, shrubs, forage for wildlife." Members in each focus group expounded on the natural role of fire in clearing excess fuels and providing habitat for wildlife. As one participant pointed out, "Some places, fire is beneficial. In

some areas it really generates the forest. Others mentioned the natural cycle of burning in pine forests for seeding.

Some participants reported fire as an inevitable part of living in the WUI and that the risk of fire is inherent in the decision to live near public lands. Others raised concerns about excess fuels on neighbors' property and public lands:

> "I've got a fire trap beside my place that is in a trust … I've offered to clean it up for the wood and different things but they won't let nobody touch it, and they won't do it. It's going to burn us all out is what's going to happen."

Dangers described by participants included deadfall from recent ice storms in the area.

Not all participants shared this view of fire, however. Some participants said that fire is not a natural part of the ecosystem and that it should be removed entirely. This however was a minority view in all three sessions. The majority of participants indicated that it is nearly impossible to eliminate the growing fire danger in the WUI and felt all landowners involved should place more emphasis on it. As one resident said, "There's no chance of stopping or preventing it (fire) 100 percent. Lightning will start a fire." Others indicated fire is not a "matter of if, just a matter of when." Participants advocated responsible and cooperative fire management between land management agencies and private landowners in order to increase focus on fire.

Participants knowledge of terminology specific to wildland fire management turned out to be less detailed than their otherwise relatively sophisticated knowledge of might suggest. For instance, only one participant in the three focus groups used the term "prescribed burn" to explain the use of fire as a management tool. Residents also displayed varied amounts of knowledge and trust in the process or personnel involved in conducting prescribed burns. As one resident explained, "The people making those decisions (about burns) are not necessarily the

people out there looking in the woods." None of the participants used the term "maintaining a defensible space" to describe homeowner defenses about fire, with knowledge of defenses being limited to describing a "greenbelt" of cleared area around the house. Residents' could articulate the protection and utility this cleared space would have in fire events, but were unsure of how large this area should be or the exact considerations needed to establish it. One resident described his personal experience with using fire, "I burn around my place pretty much for a couple of reasons, for fire suppression, for pasture lands. As long as you control your ladder fuels and know what you are doing, fire is a very useful tool."

Evaluations of Forest Service Management

Group members generally believed that land management agencies are doing a marginal job of fighting fires in the forest or preventing future ones from occurring, though they displayed knowledge of the difficulty associated with managing large tracts of land. Participants also displayed knowledge of the increases in firefighting resources and technologies driving the shift away from 100 percent fire suppression, with efforts to fight fire are viewed as more successful than 50 years ago. As one participant explained:

> I think we do a better job of fighting fire than we used to. It used to be we'd put out the fire at all costs. Well, now we are more concerned with protecting important resources that we are going to need for people to survive in the area, to keep houses from burning. But if you never let a fire burn, you are going to wind up with a worse fire hazard than if you had let the thing go.

Competence in the Forest Service to effectively manage fire was a major concern and some residents were opposed to letting fires burn or prescribed burning because they doubt agencies' ability to stop them when the encroach on private property. The following participant dialogue reflects this:

> SI: don't like the idea of just starting a fire and then going home for the day
> B: Gee, it's four o'clock.

S: They are government employees.

Lacking trust in management agencies is tied to knowledge of escaped or poorly

managed burns across the country. As one resident explained:

> But down in those big fires they've been having down in California, they've had two of
> them that they started. They (the Forest Service) started a controlled burn that got away
> from them, twice in the last about eight years.

Participants cited positive and negative experiences with prescribed burning to justify

their support or opposition of the practice. Examples of escaped prescribed burns correlated with

a majority of residents who favored mechanical thinning over prescribed burns when in close

proximity to homes. Others cited examples of reforestation, increased wildlife habitat and land

clearing achieved in successful prescribed burns. As one resident explained, "Most of the time it

(prescribed burns) works very well. I lived near Yosemite National Park and they did it there

constantly. I drove through controlled burns."

When, toward the beginning of the session, participants were asked for an off-the-top-of-

their-head reaction, about half of all participants initially supported 100 percent exclusion of

wildfires. However, residents did adopt a more nuanced view during the context of discussion

and related consideration of benefits. When asked later in the session to decide between

suppressing all fires and learning to live with fire as a part of the system, the majority chose the

latter. This same majority was in support of support of the federal governments' policy shift from

100 percent suppression. As one resident explained:

> I would say it's kind of an antiquated management philosophy. You know, initially,
> when it was set up, the idea of managing the resource, that was a key word for seeing the
> resource. And so there was no thought at all to sustainability and whatnot, some of the
> practices of do not let it burn, which went on forever; some of the practices of the
> commercialization of the forest in terms of allowing clear cuts and all this other stuff; and
> they have not changed their focus to be more up-to-date with our current times and
> philosophies. Seems like most people here seem to agree that they need to reorient their

focus more on sustainability and the values that the individual would like to get from the forest, rather than the large company.

As noted in our discussion of frames of reference, the 1988 Yellowstone fires were a major reference point for participants' knowledge of fire both as a management tool and a threat. Participants in each of the focus groups referenced the Yellowstone fires without any prompting when discussing fire management. As one resident explained, "A lot of times, like in Yellowstone in '88, they envision it burning, just staying natural and not doing anything with it. But when it burned through there, they were surprised about how the forest came back so quickly." In fact the use of Yellowstone as a symbol of wildfire management appears second in strength only to Smokey Bear, the long-running image behind fire suppression and it served as a unifying symbol of fire management in general.

Discussion

Results indicate that the members of the wildland-urban interface are aware and knowledgeable of fire danger in their area, though some individual variation is apparent. The majority of participants listed fire as the greatest natural threat to their area and expressed daily or seasonal concern about it—a far greater focus than previous studies indicate (Gardner et al., 1987; Carpenter et al., 1986; Manfredo et al., 1990). It seems that the illusion of fire safety created during to the initial success of the fire suppression era is eroding as more and larger wildland fires affect residents in the WUI. This case study suggests that WUI residents are beginning to recognize that it is impossible to stop all fires in the forest and in some cases, participants brought up areas which could benefit from controlled burns.

Participants' meanings associated with fire reflect an apparent shift away from traditional views of fires as a destructive force alien to the forest and toward fire as a normal process in forest ecosystems. However, participants seemed to have very different frames of reference

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(Goffman, 1974) for fire when it is an abstract concept burning in uninhabited forest versus when it is a tangible threat to their own and other's property. Fires burning on backcountry lands or forests far from residential areas are more likely viewed as a natural process and one that can have benefit for the ecosystem. Residents' indicated support for fire management efforts such as prescribed burns or letting some fires burn *in the backcountry,* but suppression is preferred in and around the WUI.

Participants' initial desire to put WUI fires out quickly stems from fears of property loss and personal injury to loved ones. This is an understandable response and one that is hard to change, though it does pose additional challenges for including fire near the increasing amount of homes in the WUI (Calkin et al., 2005; Kneeshaw et al., 2004). There is evidence that the association of fire danger and immediate suppression does appear to be changing, as participants' meanings quickly shifted to the benefits of fire to the forest after initial thoughts of danger. Positive associations such as reforestation, clearing of excess brush, plant succession and wildlife habitat are among the benefits participants associated most with fire and recognition of these benefits demonstrates the importance and utility of new meanings associated with fire inclusion.

WUI residents' increased focus on fire benefits shows that they are beginning to re-conceptualize fire as a natural process. This contradicts meanings associated with fire exclusion and implies that, at least to residents, fire is resuming its place as necessary component of living in the WUI. These results imply that many WUI residents now view fire as something they must learn to live with rather than control, a key step in the advancement of support for fire management efforts.

Added concern and recognition of fire danger among WUI residents also implies that they are beginning to recognize the responsibility of living in settlements near public lands.

Participants indicated that agencies managing fire should place their primary focus on public lands rather than private property. They even advocated backburning strategies as a part of fire suppression that could impact private land when there is no danger to human or animal residents. It is not that WUI residents do not want or feel they deserve help from managing agencies; rather, they reported that homeowners should be prepared enough to deal with fire situations when agencies cannot spare the resources.

Fire meanings among participants in this study now include at least rudimentary knowledge of fire ecology and defensible space requirements. Establishing defensible space is increasing viewed as a prudent planning strategy, though participants displayed varying opinions about whether it should become a legal requirement. Accordingly, participants implied that homeowners' failing to establish defensible space should not expect help from management agencies and showed little sympathy for these people in scenarios where homes burned.

New meanings for fire seem to be the result of increased prevalence and personal experience. Many participants referenced personal experience with or lasting effects of the 1991 wildfire near Spokane that damaged 114 homes. Lasting reminders such as fire scaring on trees or soot are powerful symbols and increase homeowner awareness of fire and residents without personal experience draw from the increasing prevalence of examples in other areas of the country or on the news.

Participants demonstrated surprising sophistication in their understanding of fire benefits, the shift toward fire inclusion and the history of fire suppression. Again, this knowledge varied among participants, but many were able to articulate the conditions leading to the recent increase of catastrophic fires and the reasoning behind the reintroduction of fire into forest ecosystems of the American West. These participants' knowledge about fire is much greater than documented

by previous studies (Loomis et al., 2001; Cortner et al. 1984), indicating that WUI residents are beginning to take more proactive steps to learn about and be prepared for fire events.

Those with more detailed knowledge of fire were more supportive of fire management strategies and the move away from the total fire exclusion policy. These results advance similar findings from other scholars (Loomis et al., 2001; Weisshaupt, 2005) by demonstrating that increased understanding of historical fire suppression policies allows residents to conceive of fire as a natural event. Once residents view the beneficial results of wildland fire, they are much more apt to consider fire management actions (Brunson & Shindler, 2006). This is an important, but troubling, finding for fire management actions in areas where fire remains suppressed.

WUI Participants show a lack of basic fire terminology and understanding of fire management. They were unable to describe the exact practices needed to protect their homes from fire or the names of management practices such as prescribed burning. WUI residents' knowledge seems to come largely from personal experience and word of mouth rather than scientific information or management practice.

Closing Remarks

The primary focus of this study was to understand the *meanings* wildland-urban interface residents associate with fire. This differs from previous studies on the acceptability or support of fire management by focusing on underlying concepts participants associate with fire on a daily basis. Our focus on meanings allows a practical snapshot of residents' perceptions about fire independent of value judgments influenced by outside information sources.

Our findings have a number of applications for managers. First, WUI residents changing meanings about fire salience and inclusion are at an ideal point to push for more collaborative management on the subject. Additional communication between homeowners and land

management agencies is the next step in capitalizing on this change in residents' views. Projects by land management agencies should incorporate more information on defensible space, and local knowledge about fire conditions. Agencies should also work with stakeholders to establish common values in incident response. Managers must note that increased support for prescribed burning or allowing some fires to burn are context specific and will not meet with support in every location. Of particular concern are management strategies near homes or the WUI and managers should make additional efforts to inform homeowners in these situations.

Second, managers should focus on residents' growing meanings about fire benefits in order to create more support for management strategies. As this research shows, WUI residents' increasing experience with fire continues to shape their meanings of fire and provide the basis for acceptance of management strategies. Therefore, area managers should make periodic efforts to inform WUI residents of the positive impacts of the specific burns following fire. Residents' knowledge and support did increase during the context of the focus groups and efforts to increase support should acknowledge and incorporate group discussion to capitalize on the affect of social interaction about the issue.

Managers should put special focus on the Yellowstone fire of 1988, which seems to be a particularly strong, yet subjective, symbol of wildfire management. Managers should recognize that the visibility of the Yellowstone Fires and its association with one of America's "Greatest National Treasures" has made it a rallying point for meanings of fire inclusion. Fire information campaigns should use this association to their advantage by highlighting the lasting benefits of the fire.

Third, shared understanding is an important factor in collaborative management between agencies and private homeowners; it is also important to capitalize on residents' increasing

desire to establish personal defenses. At this time WUI residents do not understand enough of the fundamental concepts about fire or use the necessary terminology to contribute to fire management. As such, managers need to make more efforts to introduce residents' to proper fire terminology and inform them of agency management procedures. Future efforts could incorporate stakeholder input in the creation of new terminology.

Finally, the above factors can help alleviate the apparent need to increase trust in agencies managing fire. This includes creating additional focus on successful prescribed burns and education about the possible dangers if managers did not allow periodic fires to take place.

Results from this study depict the WUI as a diverse population of homeowners beginning to understand the relationship between fire and the land they live on. Meanings of fire are changing to include positive benefits and the role of fire as a natural process, though there are some lingering meanings remaining from the era of fire suppression. These changes indicate WUI residents are at a crucial stage in their development toward competence about fire and their support of its management. The next steps in incorporating homeowners into fire management have the capacity to create a supportive and cooperative population of WUI residents at risk in fire.

Chapter 3: Communication and Wildland Fire

Increases wildland fire prevalence across the American West continue to create more interaction—and tension—between land management agencies and homeowners living near or adjacent to public lands. The results of these interactions often make it clear that stakeholders' drastically different communication styles affect their ability to successfully collaborate about fire management. Therefore this study examines agency communication efforts surrounding the danger or management of wildland fire in order to reduce conflict between stakeholders involved in fire events and prevent losses to private property. Ideally, land management agencies would not only strive to increase public knowledge about fire and provide justifications for management strategies, but also invoke personal responsibility toward maintaining individual defenses. Similarly, it is important for WUI homeowners to become an informed collective able to provide specialized feedback in the management process.

Communication scholarship outlines how natural resource "experts" often assume that the public will understand and uncritically accept the science behind their management strategies without wanting to provide input. Hence the traditional protocol of risk communication often overlooks the specialized input residents can provide in the management process (Heath & Gay, 1997; Gurabardhi et al., 2005). The result is both unfortunate and very predictable: WUI homeowners become detached from the management process and increasingly critical of agency efforts to manage fire. Newer models of two-way communication outline reciprocal communication among stakeholders involved in disaster management (Hance, Chess & Sandman, 1989; Heath & Nathan, 1991). Though these new model often result in support for management and increased effectiveness due to stakeholder input, the existing gulf in knowledge and terminology needed for stakeholders to "speak the same language" is a preliminary concern

in fire. Exacerbating these challenges are the residual heuristics and excess fuels established during more than seven decades of strict fire suppression, including the enormously popular Smokey the Bear campaign (Pyne, 1997; Hesseln, 2001).

In this study, I explore the intersection of natural resource and communication literatures by applying the sociological and communication perspectives of symbolic interaction social constructionism to focus group results from wildland-urban interface residents. The goal is to uncover what residents really think of agency communication or education concerning wildland fire, including its management in the WUI, landowner input in the management process and preventative measures for residents. I suggest that understanding WUI residents' perceptions about communication effectiveness, their communicative relationship with relevant land management agencies and the topics about they want more information about are a crucial basis for more collaborative management and citizen engagement around the problem of wildland fire in the WUI. Studies show that those citizens who are more knowledgeable of wildfire management strategies and their benefit to the forest are often more likely to support management action (Cortner et. al., 1990; Carpenter et al., 1986; Loomis et. al., 2001). Effective risk communication also can create greater community involvement, preparedness and organization to reduce the potential for catastrophic damage in wildfire situations. (Heath & Palenchar, 2000; Pearce, 2003)

The organization of this paper is as follows: First I will review relevant risk and crisis communication literature related the prevention and mitigation of natural disaster events such as wildland fire or hurricanes. A brief overview of the historical period of fire exclusion and more recent efforts to educate the public about its natural role in forest ecosystems will provide background concerning the challenges surrounding communication. Next I will outline the

theories of symbolic interaction and social constructionism to show how their application to citizen interactions concerning wildland fire can provide insight into new communicative strategies during fire. The paper will conclude with results from the focus groups and discussion of present and future communication efforts about fire.

Literature Review

The importance of risk or crisis communication to wildland fire is not a new concept. Rather, the success of the well known Smokey Bear campaign ("only YOU can prevent forest fires") during the middle decades of the twentieth century is an example of successful risk communication—one which contributed to fire exclusion policies and arguably the accumulation of excesses fuels in U.S. forests now threatening WUI homeowners (Pyne, 1997; Parkinson et al., 2003). Resource managers recognized the need to change public perceptions of wildfire in the 1970s after realizing the negative ramifications of fire exclusion policies (Mutch, 1976; Cortner et al., 1990), including the increased intensity and prevalence of fire in Western ecosystems dependent on periodic burns. More recent studies explore the push to reintroduce fire into the forest and to broaden public perception about its ecological role in the forest. We contend that effective risk communication is once again a central part of this process.

Risk Communication

Risk communication is a well-established discipline which began its modern stage following the 1984 Bhopal gas spill in India which that caused more than 15,000 deaths (Heath & Palenchar, 2000). Scholars define risk communication as the interactive exchange of information between interested parties about the nature, size and control of risk (Covello, 1992; National Research Council, 1989). It assumes that the public has the right to know about hazards threatening communities and includes measures of self-efficacy to inform and change behavior

so the public can protect itself (Chess, 2001). Risk assessment in wildland fire traditionally includes the accumulation of fuels, geographic vulnerability and historical records of fire severity. Newer methods include the use of GIS mapping technology to simulate fires and determine which communities face the greatest danger during different situations (O'laughlin, 2005; Tabara, Sauri & Cerdan 2003).

Similarly, crisis communication involves the dissemination of information to reduce the negative outcomes coming disasters, enhance recovery after disaster events and diffuse blame (in the case of industrial accidents) (Chess, 2001). Though distributed through a number of outlets, including the mass media, recent models advocate the fusion of crisis and risk communication (Reynolds & Seeger, 2005) and a closer relationship with community planning as a whole (Pearce, 2003).

The fusion of crisis and risk communication is the continuation of an important trend in public inclusion during the disaster management processes that began nearly 20 years ago. The traditional paradigm of risk communication, often called the technical perspective, advocated a one-way flow of information from experts to the public (Heath & Gay, 1997; Gurabardhi et al., 2005). However, a new "democratic" model advocating two-way communication emerged as a number of scholars recognized the need for local participation in management decisions or risk communication (Hance et al., 1989; Heath & Nathan, 1991) and the dissimilar conceptualizations scientific experts and the public have about aspects of risk. Most notably, the public and experts display different conceptualizations about the uncertainty of risk analysis to determine the extent and area affected by a hazard (Frewer & Hunt, 2003, Fairbrother & Turnley, 2005).

In a survey of the 349 risk communication articles between 1988 and 2000, Gurabardhi, et al. (2005) found a gradual decrease of approaches using a one-way flow of information and an increase in those which advocated reciprocity between stakeholders. For example McDaniels et al. (1999) chronicled successful efforts to include the public in information dissemination and management decisions regarding the regulation of water flows on the Aloutte River in British Columbia. Planners used valued focused thinking and adaptive management to include all stakeholders and come to mutual agreements about resource management situations.

Collaborative Management and Fire

Two-way communication is one component of collaborative management—a major focus in the natural resource and wildlife and management fields originating from a need to balance the socioeconomic desires of rural communities with the regulatory management needed to conserve ecosystems (Wilson, 2006; Payton, Fulton & Anderson, 2005). Collaborative management advocates resident input and interaction in the process of creating and implementing management strategies. In the case of fire, this includes incorporating residents' specialized local knowledge into management plans and addressing their concerns over prescribed burns (Dombeck, Williams & Wood, 2003; McCool, et al., 2006). Studies show that this collaborative approach to fire necessitates two-way communication, can reduce fire damage or severity and improve relationships between management agencies (Vogt, Winter & Fried, 2005, Tabara et al., 2003). However efforts to change public perception about fire and foster two-way communication are proving to be an enduring struggle due to the historical exclusion of fire and communication about its inherent danger. In the next section we address the root causes of poor communication about fire—the gulf between stakeholders' conceptions and communication about fire risk.

Differing Conceptions of Fire

Changes in risk communication, collaborative management and efforts to educate the public about fire are especially important in this paper because fire managers and the public share concerns regarding wildland fire or natural resource management (Winter & Cvetkovich, 2003; Zaksek & Arvai, 2004; Vinning, 1992). Zaksek and Arvai (2004) found significant differences in fire knowledge, information needs and conceptions regarding wildfire management between experts and nonexperts in a Canadian wildland-urban interface. Not surprisingly, nonexperts demonstrated gaps in knowledge about fire and a lower understanding of risks or benefits compared to experts. Important differences included a lack of nonexpert knowledge about fuel reduction and danger to drinking water sources, but an adequate knowledge of the threats wildland fire poses to air quality, wildlife and soils. Interestingly, experts were lacking in their acknowledgement of escaped prescribed burns as an origin of fires or the options available for risk management (Zaksek & Arvai, 2004).

Daniel, Meitner and Weidemann (1994) expanded on the rift between experts and the public by recognizing that stakeholder concerns usually do not match up with technical or logical dimensions of risk. Rather, action regarding personal fire management strategies is based on emotion accessible through persuasive appeals. Casey (1994) capitalized on emotional appeals to educate homeowners by providing simulations of wildfire damage to residents' communities. These visual representations increased homeowners' understanding of fire risk and approval of fuel management strategies.

Early studies on public attitudes toward fire demonstrated that increases in the level of public understanding about fuel management strategies and the ecological role of fire did much to increase support for fire management strategies (Cortner et al. 1984; Carpenter et al. 1986). By

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1995, the US Departments of Agriculture and Interior were advocating messages about ecological role of fire and management strategies (USDI & USDA, 1995). A study of Florida residents by Loomis et al. (2001) of Florida residents found educational programs aimed to increase knowledge of wildfire benefits and management procedures did increase attitudes toward prescribed burning, although initial differences in Floridian's knowledge were present.

Beginning with Stankey (1976) a series of studies advocated that managers take efforts to educate and inform the public through communication programs aimed at a broad audience. These messages not only include the ecological role of fire and fuel management strategies, but information about establishing defensible space and the risks individual communities face in the event of a wildfire (Manfredo et al., 1990; Clark, 1997; McCaffrey, 2002). Other studies indicate efforts to increase public knowledge about fire and support for management techniques are succeeding (Shindler & Reed, 1996; Kneeshaw et al., 2004), however acceptance of fire is a complex issue which varies across geographic and situational differences (Brunson & Shindler, 2004). For example, Daniel et al. (1994) found many city dwellers do not understand the dangers of wildland fire and even if they do, may be unwilling to compromise their idealized perception of natural beauty. Even in the wildland-urban interface, Gardner et al. (1987) found residents in Southern California were unreceptive to wildfire mitigation programs due to low awareness of fire severity and occurrence.

Studies by Winter et al. (2002; 2004) provided further insight into collaborative efforts and communication by uncovering perceived competence and experience of agencies managing fire are as important to WUI residents' support of the management process. This includes efforts (or perceived effort) to communicate management justifications and inclusion of the public in the management process. Shindler and Reed's (1996) study of residents in the Blue Mountains of

Oregon also demonstrated an increased need for trust and cooperation between stakeholders, including visible results and proper communication of the actions undertaken. A follow-up study demonstrated a decrease in residents' ratings of Forest Service information about recreation and management or fire risk, preferring other sources they viewed as more credible (Shindler & Toman, 2003). Distrust between the public and the Forest Service had led to an erosion of their relationship, which often creates hostile work environments for employees in the management agency and reduces residents' willingness to consider new management information. Skepticism about management interaction is of crucial importance to agency trust and could be the start of a growing trend toward distrust in areas with histories of escaped prescribed burns or excessive smoke from fuel management (Winter et al. 2002, Weisshaupt, 2005).

New Conceptions of Fire

In response to these new concerns and the perceived benefits of a democratic approach to risk communication in wildland fire, recent studies focus on integrating two-way risk communication and working closely with WUI homeowners. Interactive fire education programs appear to be the most effective method for increasing homeowner acceptability of fire management, though few have had such experiences (Brunson & Shindler, 2006). More often participants report the unilateral or one-way distribution of information from experts. Efforts to introduce interactive education programs include Parkinson et al.'s (2003) extension of a children's wildfire education program (FireWorks) to adult populations and Thomas, Walsh and Smith's (2000) demonstration that increased information could benefit seventh graders perceptions of wildfire acceptance. Interactive formats open up the opportunity for more face-to-face communication with managers, an avenue for proven increases in trust (McCaffrey, 2004).

The FireWise Communities Program is another recent effort to include and delegate responsible citizens in the management and increased knowledge of wildland fire. Created by the Wildland/Urban Interface Working Team (WUIWT), a compendium of government agencies and regulatory organizations, it encourages communities to take responsibility for creating fire defenses community with established emergency response procedures. As part of workshops and information available to communities, these education programs offer GIS mapping scenarios for planners and concerned citizens to better understand localized impact of fires.

Symbolic Interactionism and Social Constructionism

This study uses Blumer's (1969) symbolic interactionist approach to understand the views of wildland-urban interface residents regarding wildland fire communication efforts and management strategies. It places focus specifically on meanings and frames of reference held by study participants concerning (in this case) wildland fire as a source of risk to the WUI, communication efforts by management agencies concerning risks and appropriate management actions by agencies and local citizens.

Symbolic interaction views humans as pragmatic actors who create and modify the meanings of salient objects in their world (Blumer, 2000). Thus, human actors' communication and the meanings they have for salient objects become a central focus. This differs from traditional disciplines such as psychology which Blumer (1969) believed focused too intently on behavior as a product of decision making.

Three underlying tenants guide Blumer's (1969) classic conception of Symbolic Interactionism. It states human beings act toward objects, defined as anything indicated or referred to, on the basis of the meanings they have toward them. The second premise implicates the process of interaction between people as the source of these meanings. Thus, *shared*

meanings evolve as people interact with each other in relation to salient objects (Mead, 1934). This places primacy on the interaction or communication between people rather than merely the vehicle for sociological factors leading to behavior.

The third premise of symbolic interactionism states that individuals incorporate and handle meanings through a process of communication and interpretation. Through this process, actors establish what objects in the environment are salient and arrive at shared meanings for such objects. These shared meanings in turn guide actions in the context at hand.

Of particular salience to the discussion at hand is symbolic interactionism's recognition of the public as a collection of competing or conflicting interest groups and an often disinterested or spectator-like citizenry (Blumer, 2000). The former group attempts to sway public opinion to their cause and thus achieve social change (Blumer, 2000), succeeding only when the disinterested citizenry is able to engage in common dialogue or agreement with their perspective.

Newer models of issue evolution view these changes as socially constructed "distortions of enacted structure" in society (Lamertz et al., 2003; Stryker, 1980). The resulting failure of social order and mutually accepted rules leads to competition for a new structure and the inevitable adoption of a new standard for dealing with the objects in question (Weick, 1993; Goodin, 1998) According to Blumer (2000) this is part of the natural continuity of a mass society. The shift of focus in wildland fire management to include fuels management, the adoption of a view of fire as a natural and healthy part of ecosystems and a newfound belief that local residents bear responsibility for firesafeing can be taken as a examples of this process of societal change through symbolic interaction.

Borrowing from similar sociological traditions, the concept of social constructionism maintains that human meanings are the product of social systems and the web of interactions

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societal actors are an inherent part of (Allen, 2005; Leeds-Hurwitz, 1995; Lindloft & Taylor, 2002). Social constructionists maintain that the construction of reality depends on the use of language and treat explicit communication as the mechanism humans use to create and renegotiate their world (Lincoln & Guba, 1985; Berger & Luckmann, 1966). As such, scholars maintain that social discourses are the source of human knowledge and their study must recognize the way language changes according to time or place (Allen, 2005; Jorgensen & Phillips, 2002). Others maintain that language is the only true reality because it is the system humans use to internalize socially constructed meanings—concepts only become "real" when there is consent on their parameters (Emery, 1978). As Schwandt (2000) states, "human beings do not find or discover knowledge so much as we constrct or make it …against a backdrop of shared understandings, practices, [and] languages" (p. 197).

Though critical in nature, social construction is useful to this study because it assumes that the processes of meaning creation depends heavily on social, political and historical factors (Jorgensen & Philips, 2002). It assumes that constructed meanings can influence social action through the renegotiation of societal discourse (Allen, 2005).

A small body of research applies symbolic interactionism to natural resource management (Thomas & Garkovich, 1994; Jorgensen & Stedman, 2001). For instance, Pregernig (2002) used a symbolic interactionist framework to describe how forestry professionals use interactions with others to form opinions on management strategies. Similarly, Thomas and Garkovich (1994) used a social construction perspective to better understand how a cultural group developed meanings of nature and the conception of a particular landscape. Carroll (1995) used symbolic interactionism as a way of understanding the attachment of Northwestern loggers

to their occupation and way of life and their disaffection for the "urban majority" who they believed were out to destroy both.

Scholars are also paying increasing attention to the intersection between social constructionism and natural resource management (Bakker & Bridge, 2006; Ciccantell, 1999). For instance, Riemer (2004) used social constructionism to understand different stakeholder perceptions of Walleye spearfishing in Michigan and alleviate management concerns about its increased scarcity. Likewise, Schelhas and Pfeffer (2005) uncovered how local and national discourses about environmentalism influences stakeholders views about forest management in Costa Rica. Or particular importance to fire is Robyn's (1994) Australian study demonstrating how a lack of shared terminology between stakeholders resulted in conflict over resource management.

I believe a perspective that combines symbolic interactionism and social constructionism will provide added insight concerning our understanding of WUI residents' knowledge, and views concerning wildland fire. Put in the language of these two concepts, I focus on discerning the frames of reference, meanings and communicative practices WUI residents have relative to wildfire rather than assuming they agree with those held by resource professionals. It also places emphasis on the specific language and communication surrounding the concept. Besides eschewing predefined categories of responses, inherent in conventional survey research, this approach differs in another way from traditional studies of attitudes toward fuels management and wildland fire which use belief-attitude-behavior models (Ajzen & Fishbein, 1980;). These foci often fail to adequately predict actual behaviors regarding natural resource issues (Griffin; 1989; Weigel & Weigel, 1980), because they focus too much (in my view) on the external

antecedent factors leading to action rather than the construction of the meanings people use as a basis of action.

Methods

According to Blumer (1969), any study using a symbolic interactionist approach should involve direct examination of the empirical social world. Likewise, studies using social constructionism must allow researchers to analyze directed discourse about a subject of interest (Allen, 2005). In this instance, focus groups seem an appropriate way to discover the salience of and meanings around fire held by WUI residents because it allows for open-ended questions and detailed explaination of views by participants. Focus groups also allow the opportunity for social interaction and the observation of how such dialouge influences participants' interpretations (Lindloft & Taylor, 2002). This method has advantages over surveys or one-on-one interviews in that it encourages participants to view alternative opinions and gives them the opportunity to work through questions to more fully express themselves and to convey their frames of reference on complex issues. Furthermore, it also allows insight on how context of group discussion modifies these conclusions (Krueger, 1994).

Any mention of communication about wildland fire would be incomplete without acknowledging the role of mass media in opinion creation. Because mass media often focus on only large fires or those which cause substantial damage, it may foster a distorted public view of fire prevalence and severity (Jacobson et al., 2001). Therefore the media is a crucial aspect of how influence in public perceptions of wildland fire because those without personal knowledge draw their attitudes from what they see on TV or read in the newspaper (Beebe & Omi, 1993; Weigel& Weigel, 1978).

Focus groups were conducted in the greater Spokane, Washington, area as that area has a relatively diverse rural population (Findley et.al 1999) and has experienced its share of WUI fires the most dramatic of which was a large wildfire that burned the area in 1991 and damaged 114 homes. A purposive sample of participants was recruited for this study using maps of the area, to identify possible wildland-urban interface residents. In drawing the sample, the focus group moderator drove to the location of each possible participant to ensure their proximity to public lands or inclusion as part of the WUI. This process is especially important because it ensured the participation by a variety of WUI residents. Once location of residence was confirmed a combination of door-to-door recruiting, doorknob hangers, and telephone directories to find names on mailboxes were used to complete recruitment. Participants who were receptive to the project went through an additional screening process over the telephone to eliminate those with family ties to public forestry, wildland firefighting or forest product industries. While screening was used in the selection of WUI residents, no effort was made to distinguish residents by their educational background.

This procedure differs from previous attempts in that the moderator actually visited the site of residents to verify their inclusion in the wildland-urban interface. Traditionally, researchers contacted residents over the phone using reverse directories and asking a series of screening questions. This led to increased specificity in the sample selected, with some residents living adjacent to public lands and others closer to more manicured or urban environments. The effort of this study was to focus on those living near state or federal lands such as those management by the Forest Service, state parks or Bureau of Land Management rather than privately operated forested property such as golf courses and Christmas tree farms.

A total of three, 120-minute focus group sessions were conducted in the Spokane area in March 2006. Group size ranged from 10 to 13 participants. While this is a small number of focus groups compared to other studies, we argue the rigorous steps taken to recruit a heterogeneous population of wildland-urban interface participants make it a significant replication of a specific subset.

A professional focus group moderator led the discussions at specially designed focus group facilities. Sessions began with general questions regarding the area and quality of life and gradually narrowed to topics concerning the topics concerning fire in the forest, fuel management strategies, the role of management agencies and public involvement in preparing for fire hazards.

Participants were told the focus group would concern management of public lands but not specifically informed of the topic of discussion. The moderator began sessions by explaining no outcome was expected and all opinions were welcome. He asked questions and then let discussion unfold between participants.

Results

I found four significant themes connected to residents meanings of communication. These included the types of communication they wanted from the Forest Service and their existing sources for information on the agency; their evaluations Forest Service attempts to communicate fire messages and related information; participants existing meanings of the relationship between WUI residents and the Forest Service; and meanings surrounding Smokey Bear's use as a symbol of fire inclusion. I will discuss each of these themes below in detail and provide examples of participants' views on the topics.

Communication Desires and Sources

The majority of participants agreed that one of the primary responsibilities of the land management agencies such as the Forest Service is communication with the general public. Participants' primary sources of information about the Forest Service are the Internet and personal interaction. Interactions with family, friends or neighbors who work for the agency were common and those who had personal interaction with Forest Service personnel reported more positive views of the agency. As one resident said, "I sit on a committee with a retired Forest Service gentleman, so I look to him as a resource, not only about natural resources, but historical resources." These individuals also identified more with the difficulties of managing large tracts of land and the budget constraints limiting the number of personnel working for the agency. Residents indicated that the Forest Service personnel they worked with related well with the public and promoted a positive experience. Another resident described his personal experience with Forest Service personnel:

> We used to deal with the Forest Service years ago when I cut firewood up in there. It was Fernan, mostly. They were easy people to deal with. They are all friendly. They were quite knowledgeable about where you could find a lot of good downed timer. They knew the countryside up there well.

Participants reported that two-way, face-to-face communication between managers and the public is the most preferred method for issues surrounding fire. They expressed a desire for the land management agencies to work with residents by getting input on management decisions or having meetings to discuss management objectives. They also advocated educational efforts to inform residents of the shift toward fire inclusion, fire ecology and defensible space requirements. As another resident pointed out:

> I think that if the information that they have is that we need controlled burning, and that's in everything I read, but they really, that's in the paper, that's wherever. I don't get any personal information that I can sit back and actually read a report and compare. If this is what they want, I think they have to get out and get the public to realize that's what we need for our future, for our children's future, and convince people.

Residents shared a common desire for land management agencies to provide information about homeowners establishing and maintaining a defensible space. Though they feel the homeowner has a primary responsibility for creating defenses against fire, many were unclear of the steps needed to do so. As one resident articulated, "It seems like it would be better to educate people. If people realized, just limit these trees a little and watering your lawn is going to increase your chances (of decreased damage during fire)." Other participants indicated they would at least like agencies to inform them of the possible dangers of fire to their property. As one explained, "It might be the government's duty to let people know how, to know what the dangers are in their area. Just because they are supposed to look out for the citizens, that's what the government is for."

Residents also wanted the public agencies to inform them of prescribed burns scheduled on national forest lands near their homes so they could adequately prepare. They indicated that decisions to set back burns during firefighting should include residents, regardless of their ability to change the outcome. As one resident pointed out, "I think they have a duty to inform the homeowner what's going to take place, what they are going to do, what they aren't going to do. Then the homeowner is on his own." Others indicated that making an effort to keep homeowners updated on prescribed burns or firefighting is a minimum consideration for trust between the Forest Service and WUI residents. This could also increase understanding of the agencies' duties in the forest. As one resident said:

> I think education from them is a very good thing, with fire management. Like they say, to make sure we all know and understand if it were to happen, a prescribed burn, that we know that it's part of their plan and that it is a good thing, and the reasons why.

Evaluations of Existing Communication

When asked to give advice to land management agencies, many participants advocated increased communication with the public about fire. Participants indicated communication about land management is lacking and most do not know where to search for additional information about the agencies or their stances on fire. As one resident said,

> One thing I'd like to see with the Forest Service is informing the public more. It's a wild thought, maybe put together a newsletter and send it out to everyone who lives in rural counties, who lives near these forests and have it deal with forest fires …

Participants brought up poor communication about fire or lack of contact between the Forest Service and the public when the focus group moderator first asked them to describe the agency. Some residents complained that it had been a long time since they interacted with anyone working for a land management agency, specifically the Forest Service. As one person said, "it is quite hard to find them, where they are. I'm talking about just regular people trying to get some information." Others complained that the agencies do little to inform homeowners about management practices near their homes. Thus, access to information is another important point. As one resident complained:

> To some degree, to find good information, which is very hard to find, you actually have to either call them, go see them directly, or go drill down in their websites to try and find the contracts …because they are not going to make that information easily available.

Residents also reported a decrease of interaction between the public and land managers. Local information about fire inclusion programs confused many participants and they are unaware of what efforts they should take to modify their property for fire. As one resident pointed out:

> They (Forest Service) very much need to improve their communications. Yes, because they have put out misinformation and they have changed things, or curtailed programs that they said were going to happen. You never hear about the change or you never hear about the curtailment. You just hear nothings. So that would not only help the public, but it would help them a lot too, because the PR thing is one of the areas where they are really falling down.

At least one participant in each focus group made specific mention to the education programs FireWise or FireSmart provided by the Interagency Fire Coordinating Group. The project received favorable reviews from those who mentioned it and stimulated interest among other members of the focus groups, though the there was some incongruence as to the exact name of the program. As one resident described, "Well they have people that came out and showed us about how not to put nothing up against your house and how to make sure it was clean and safe around it and that." Strengths of the project were the face-to-face interaction with homeowners and the willingness of personnel to help with the clearing of forest lands. Others acknowledged they had heard of the project after participants mentioned it:

> That's one word that's going around quit a bit in Coeur d'Alene. It's a program that if you have a home that's next to forest land, and it can be a fire problem … the fire at Fernan, and their home was done completely, the trees are cut, the brush was cut out. So the fire would be more apt to stop away from the house structures.

Relationship With the Forest Service

Participants indicated that they generally did not feel included as a stakeholder in their National Forests. Many said the Forest Service served its own purpose without considering the public or their uses of the land. This included opportunities for dialogue between the public and land managers. As one participant said:

> I think of myself as an owner, but I can't do anything with it (National Forests). That's why I can see anything I want to do, but it doesn't matter because it's managed by somebody … in another part of the world, who has lost touch with what actually needs to be managed.

Others indicated a view that that the Forest Service does not work in the general interest of the public and decisions on management do not make sense to them. As one participant articulated, "they (the Forest Service) have very narrow minds of where they want to go. Directed by who knows who."

Participants also displayed a lack of trust and knowledge about the Forest Service. Some of this distrust stemmed from participant perceptions that the Forest Service has close ties to logging companies and was seen as largely focusing on profits from these business rather than stakeholder interests:

> A comment was made about who they [the employees of the Forest Service] work for, I think I heard somebody say the logging companies. That's kind of my perspective as well. That it has recently been more of an offshoot of facilitation logging versus the other multiple use charge of the Forest Service, which is recreation.

Many participants indicated that they did not understand the management responsibilities of the Forest Service while others felt that the agency should reorient its management to "take care of the interests of the public and forget about politics." Unifying symbols of the Forest Service include Smokey Bear, green uniforms, forest rangers and wooden signs indicating the entrance to forests. However, our participants reported seeing fewer Forest Service personnel in the forest and having limited interaction with agency personnel. As one member asked, "Are they around (the Forest Service)? I've never seen one up there in the ten years I've lived up there."

Bureaucratic constraints and recent cutbacks in Forest Service budget were among the topics participants described as limiting the abilities of the agency to be effective. The majority of participants indicated that the Forest Service should have more workers in the forest or rather than what they perceived as an excess of workers in offices. As one president articulated when describing the Forest Service:

> Too much top-down. It's a very large bureaucracy, and it doesn't necessarily have to be top-heavy. The policies are formulated … It needs more, you meet the individual Forest Service worker, and usually they are very concerned with where they are and what they are doing, and want to do a better job, but they can't.

Smokey the Bear

Smokey Bear remains the most endearing and recognizable symbol of fire management, though there is some confusion over whether his original message actually contradicts the new paradigm of fire inclusion. Residents did agree that Smokey Bear stands for fire suppression and responsibility. However, they were quick to defend Smokey by pointing out that this message applied more to campground fires and man-made forest fires than naturally occurring burns. As one resident pointed out, "Smokey is going after man-made fires, your campfires, and those kinds of things. It's not the lighting strikes and the power lines going down, that kind of stuff."

Most participants recalled Smokey's phrase "only you can prevent forest fires" when asked about the character and reported how effective the promotional tool was in teaching them about fire when they were children. As one resident said, "I remember taking it personally (Smokey's message), that is was a responsibility of mine not to let some fire I'm having get away." Participants also reported that Smokey is not as prominent as he once was and "he hasn't been updated much" to reflect the new fire management strategies of the Forest Service. Other lessons associated with Smokey Bear were the danger of fire and the responsibility of using fire in the forest.

A large majority of participants chose to retain Smokey as the Forest Service's symbol of fire management. They indicated that the symbol retains too much social capital to discard and residents indicated it would damage trust in the Forest Service by removing a sense of familiarity. As one resident said, "Well, I think probably Smokey, because he started and I guess his word is still good, so if he tried to say, well, all fires aren't bad, I think people would listen to him." Other participants contend Smokey never dealt specifically with fire responsibility and did

not directly relate him to the strict suppression of fire. Therefore, his message could easily encompass the inclusion of fire in the ecosystem.

Some participants advocated pairing Smokey with a new animal symbol to show the change in forest service management. They indicated that this could relieve the confusion created by a new message from a character so strongly associated with fire suppression: "Why can't you have Smokey Bear interacting with a deer or something like that. The dear has a message and Smokey has a message."

Residents felt Smokey's role as an educational tool for young children would prevent cognitive dissonance about his message. Most children are not as familiar with Smokey as previous generations and the change in ideology could occur with little trouble. As one resident explained during their argument to retain Smokey:

> Education comes at the elementary school level, and elementary kids don't know anything about Smokey's past. And I recall, too, within the past three years Smokey has been to the elementary school where I taught, so he's still out there.

Discussion

Communication is at the root of trust issues between the Forest Service and WUI residents concerning fire. Participants indicated that communication with the public is central to their meanings of public agencies such as the U.S. Forest Service. This includes personal interaction or visible symbols *communicating* Forest Service efforts to manage public lands for fire. This study advances similar findings about the importance of visible management strategies in support of fire management (Shindler & Toman, 2003) by extending it to outreach and communication programs. Personal interaction with homeowners can instill trust by communicating a message of respect and concern about the effects of fire management to private homeowners. Participants indicated that the Internet and personal (family, friends) contacts with

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Forest Service personnel were their primary sources of information about the agency. Absent were Forest Service outreach programs and communication efforts, in fact, many participants indicated the educational materials available were confusing or hard to access. On the other hand, personal interactions seem to "humanize" the Forest Service by providing a name or face to associate the agency with, thus decreasing meanings as a "top-down" institution.

Two-way communication about fire appears to be the most preferred and effective means for disseminating information about fire management. WUI residents' indicated that they would like input and to work with management agencies in the management of fire. Of particular importance are hands-on programs such as FireWise or FireSmart, as participants in each focus group brought them up independent of any prompting. Outreach programs such as FireWise and FireSmart allow interaction between fire professionals and communities at risk for fire while educating them about their defenses against fire. The result is increased trust in management agencies and personal responsibility for fire management (Thomas, Walsh & Smith, 2000; McCaffrey, 2004). Residents' desire for two-way communication and hands-on education such as FireWise imply a shifting focus toward collaborative management about fire. This is a key step toward support of fire inclusion strategies such as prescribed burning.

Results of these focus groups indicate that residents' want communication efforts to focus defensible space requirements and management actions such as prescribed burning or backburns during fire events. WUI residents display a preliminary knowledge of these issues but it is apparent that more sophistication is needed for them to take responsibility or protect themselves during fire. Again, communication efforts during fire preparation and mitigation allow residents to participate in the process and increase their support for management actions. For instance, these results indicate that communication efforts about the standards for defensible space and

prescribed burning can help alleviate perceptions of Forest Service responsibility and blame after fires.

Smokey Bear continues to be the most endearing and long-lasting symbol of the Forest Service and participants indicated he can carry new messages of fire inclusion. This is especially true for younger populations who have had less interaction with Smokey due to a gradual decrease in education programs using the symbol. Results indicate that removal of Smokey as a Forest Service symbol due to his fire message would actually damage trust more than changing his message. It appears that Smokey is not "typecast" in his role of fire suppression, as many residents' meanings about the character include fire responsibility rather than its absolute removal.

WUI residents' want more collaboration and communication between homeowners and public agencies managing fire. Their perceived lack of interaction or efforts to communicate with homeowners has created a population very critical of agency management and wary of their motives.

Residents' perceived lack of communication with management agencies is a cause and consequence of their varying knowledge about fire management and public lands near their homes. However, their perceptions of land management agencies, in particular the Forest Service, show declines from previous studies (Cortner, 1990; Carpenter et al., 1986; Loomis 2001). It appears that widespread support or recognition of the Forest Service and its symbols continue to diminish due to a lack of contact (Shindler & Reed, 1996; Shindler & Toman, 2003). Rising fears of fire prevalence and lack of faith in agencies to reduce the damage also plays a part.

There are a number of factors contributing to the decrease of trust and support for Forest Service management of fire. Participants' indicated their input is not a factor in Forest Service management, contradicting dominant meanings of public lands serving the interest of the people. These interactions give the message that the public is a "muted" stakeholder in the planning process and leave WUI residents feeling powerless to change existing management. Perceived lack of input in the planning process reinforces existing tensions between WUI homeowners and management agencies and decreases their support of management strategies (Carroll et al., 2005).

WUI residents' lack of knowledge about Forest Service duties and responsibilities in fire management also makes them *unable* to contribute to the planning or management process. They do not display sufficient knowledge of Forest Service management efforts to adequately critique them or express the changes they would like to see. For instance, residents are unclear on Forest Service responsibility to fight fires on private lands in the WUI. Though the majority of participants agreed the focus of firefighting efforts should be on public land, they would still like to be informed of their options during fire.

Not surprisingly, concerns about bureaucratic management contribute to trust issues between the Forest Service and WUI residents. Similar criticism of "top-down" management and not enough workers in the field often lead to conflict during fire events (Schnider, 1992; Carroll et al., 2006). Residents mentioned locations with excess fuels, perceived ties to logging companies and clear-cuts as examples of the capitalistic motives of the service.

Closing Remarks

Natural resource issues garner more media and public attention than ever before due the recent increase of natural disasters such as fires and hurricanes. Land management agencies

such as the U.S. Forest Service need to acknowledge the added focus on resource management by taking proactive steps to communicate with a public largely unaware of their efforts. Failing to capitalizing on renewed public interest in fire contradicts the recent push for collaborative management and stakeholder input in the resource field. The "era of fire inclusion" implies that fire is a *social* issue and necessitates open dialogue about the change.

The results of this study pose a number of implications for managers and communication efforts about wildland fire management. First, the Forest Service should focus its risk communication on homeowner defenses during fire. Studies show that residents are becoming increasingly aware of fire danger, yet they do not always have detailed knowledge of what to do about it. Managers can capitalize on the desire for more information about defenses by disseminating informational newsletters about the topic. Internet sources are an important avenue for expansion of these suggestions as it becomes the primary source of public information.

Second, programs such as FireWise should expand to educate more homeowners about fire ecology and fire management. Increased sophistication in WUI residents' knowledge will give them the ability to contribute to fire planning processes and decrease tensions by allowing stakeholders to "speak the same language." Current efforts of these programs to educate homeowners on defensible space or their options during wildfire deserve expanded scope due to their effectiveness.

Third, the U.S. Forest Service needs to take proactive efforts to improve its communication with the public. A number of communication strategies can help accomplish this, including: (1) Face-to-face outreach programs or letter campaigns outlining Forest Service duties and efforts to management fire in the area. These outreach programs could "humanize" the Service and provide avenues for additional information about fire. The resulting increase in the

visible symbols of fire management will create more support and trust in the agency. (2)

Managers could communicate a message of respect for WUI residents' knowledge and

perspectives by inviting the public to participate in discussions about fire management or view

efforts in their area. The benefits of collaborative management are twofold: Agencies can utilize

specialized local knowledge and reduce liability by informing WUI residents of dangers in their

area. (3) Mangers could increase the visibility of online information and policy about fire

inclusion and management efforts such as prescribed burning. The visible aspects of this medium

make it an ideal place to show the benefits of prescribed burns and provide lasting symbols

supporting fire inclusion.

Finally, Smokey Bear should adapt to carry the Forest Service's new message of fire

inclusion. The symbol should return to its original prominence in order to retain the trust and

positive associations it still holds for WUI residents. Smokey has his ability to socialize entire

generations to a message of fire inclusion and children are unaware of previous associations.

Fire is an inherent social issue that necessitates public understanding and feedback.

Increased efforts to communicate with residents at risk for fire is the next logical step in the era

of fire inclusion and a necessity as catastrophic fires continue to increase. Scholars agree that

public support is crucial to fire management in the coming decades, but it is also important to

recognize that communication is the core component of that support. Future studies should

recognize this by studying the affects of communication strategies on public support for fire

management and the relationships between agencies and WUI homeowners.

Chapter 4: Closing Remarks

In this section I will explain how the results from these two studies advance theoretical knowledge about wildland fire. I will also link the theoretical aspects of these two studies and explain how the incorporation of sociological concepts creates a basis for future communication research. Of particular importance to this argument is the role of communication as the origin and moderating force driving the constant renegotiation of wildland fire between the Forest Service and affected publics such as those in the wildland-urban interface.

In these studies I argue that researchers must understand the everyday meanings and importance WUI residents have for wildland fire before conceptualizing communication strategies aimed to foster collaborative management or increase public support of fire inclusion. This conceptual convergence of symbolic interactionism, social constructionism and stakeholder communication is a practical way to create an active and engaged population capable of reducing fire danger on their land. The result is a win-win situation for all stakeholders involved: WUI homeowners can protect their homes from increasing fire danger while agencies such as the U.S. Forest Service can utilize local stakeholder knowledge, increase trust for the organization, and reduce the amount of structures they need to protect in the event of a fire.

The results of these studies suggest that focusing on WUI residents' everyday meanings of fire are a useful antecedent to communication about fire. WUI residents have much different conceptions about fire in the Wildland-Urban Interface and the backcountry, which also has an affect on their communication demands. These findings have many implications for future communication strategies about associated policy or tactics. WUI residents' knowledge of wildland fire is another good example, as their lack of proper terminology or understanding of fire inclusion policy makes them incapable of communicating with the Forest Service about fire

management. Therefore it is imperative that researchers expand this conceptual cusp of sociology and communication to advance collaboration during the era of fire inclusion. This could include future studies linking specific communication strategies to changes in residents' frames of reference for fire.

In these studies I also argue for the convergence of risk communication and wildland fire literatures. It is my contention that risk communication theories can help increase trust and support between WUI homeowners and land management agencies. I also maintain that effective risk communication is essential to reducing fire losses because it can create an informed and responsible population of WUI residents who reduce excess fuels on their land and want to collaborate on fire management. Our results indicate that WUI residents agree with these propositions and would like to see additional communication and interaction with the Forest Service about fire issues. The need for added communication is apparent in focus group participants' explicit requests for additional information and interaction with Forest Service personnel on the topic of fire. They indicate that communication about fire should convey Forest Service conceptions of fire and its management so that WUI residents can understand their different views of risk.

The results of these studies demonstrate that WUI residents' are beginning to recognize the importance of fire to the forest ecosystems they live in and their responsibility to protect their property when burns do occur. This is a critical turning point for fire inclusion in the American West and managers would do well to choose their communication efforts carefully. Future studies should adapt existing models of risk communication for wildland fire and develop communication strategies specific to this unique type of disaster event. As these results indicate, fire is an inherently social issue that WUI residents associate first and foremost with fire

managers. Ironically, risk communication is partly to blame for the conflict often occurring during fire management, a topic addressed below.

It is important to note that the communication processes accompanying trends in fire policy greatly influenced the public's views on the subject and continue to shape its future direction. With this in mind land management agencies managing fire not only need to associate new messages of fire inclusion through existing channels, but adopt more face-to-face communication strategies to combat the cognitive dissonance among competing paradigms. Our results indicate that Smokey Bear is too valuable a symbol not to use in fire inclusion, but that additional efforts are needed to help WUI residents' overcome their fears that Forest Service officials could be wrong in their decisions to include fire in the forest. Future studies should explore the face-to-face communication strategies best suited to carry these new messages and also focus on hands-on learning activities that could lay the groundwork for collaborative partnerships between communities and the management agencies. Theoretical opportunities for study include the conflicting identities of forest managers attempting to deal with the shift to fire inclusion and the other community factors leading to conflict during and after fire events.

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