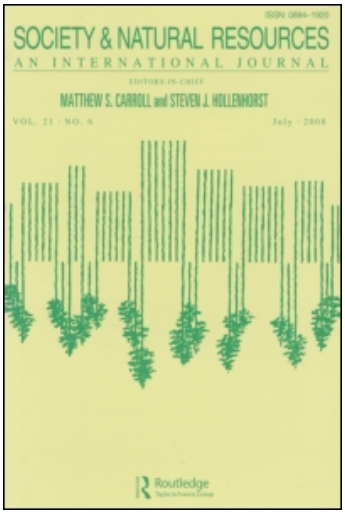

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Symbolic Meanings of Wildland Fire: A Study of Residents in the U.S. Inland Northwest

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Symbolic Meanings of Wildland Fire: A Study of Residents in the U.S. Inland Northwest

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This study uses symbolic interactionism as a basis for understanding the salience and fundamental meanings of wildland fire to wildland–urban interface (WUI) residents. It contributes to an understanding of how WUI residents actually view wildland fire, its role in forest ecosystems, and its attendant risks for human settlements. Three focus groups were conducted with residents of the wildland–urban interface near Spokane, Washington. Results indicate a high level of salience of wildland fire to participants' daily lives and significant concern about the risk of fire events. It also revealed strikingly different frames of reference for fires burning in the WUI or in areas away from human settlement. The study concludes with considerations for building shared meanings of wildland fire among WUI residents and managers.

Keywords focus groups, trust and risk management, wildfire, wildland fire management, wildland–urban interface

Increases in the size and intensity of wildland fires along with continued expansion of human settlement in areas near wildland vegetation (wildland–urban interface) has led to renewed calls for changes in fire management strategies on public forests, particularly those proximate to residential areas (McCool et al. 2006). The threat

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of wildland fire to people and homes in the wildland–urban interface (WUI) has spawned debate over where the responsbility of forest managers responsibility and where that of homeowners, neighborhood associations, and local governments begins in terms of protecting human infrastructure from the threat of wildfire (Shindler and Toman 2003; USDA 2000).

Coincident with this is a shift in resource management agencies and policymakers' messages to the public regarding 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 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. Not all fires are ''bad''; some fires are ''good''—prescribed or natural fires can help prevent more frequent catastrophic ones. 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.

Studies during the past 30 years show increases in public knowledge of wildland fire mitigation strategies and severity of danger associated with fire (Cortner et al. 1990; Manfredo et al. 1990; Loomis et al. 2001). While the former trend is a beneficial step for a number of strategies designed to improve ecosystem health in fire-dependent areas or mitigate fire danger to human settlements (i.e., prescribed burning or mechanized thinning), the prevalence of not-in-my-backyard (NIMBY) groups, resistance to prescribed burns, 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 (McCaffrey 2006; Absher and Vaske 2007). These populations are most at risk from wildland fire, the most likely to interact with resource management agencies, and the ones from whom the most is asked in terms of citizen actions to mitigate fire risk in residential areas.

There is a well-documented tendency in the social–psychological and communication literature (Frewer et al. 2003; Hibbard and Lurie 2000) for communicators to assume that an audience 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; Carroll et al. 2005). 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.

Our study extends the Weisshaupt et al. (2005) work on the social acceptability of prescribed burning in and near the WUI by focusing more broadly on WUI residents' views concerning the role of wildland fire in landscapes with human habitation and those in the backcountry. To do this we apply a symbolic interactionist perspective to focus groups of WUI residents. Specifically, this study seeks to better understand the salience of and meanings associated with wildland fire in the minds of WUI residents. We place particular emphasis on knowledge and perceptions of fire-related risk on the part of such residents. Understanding the salience and meaning of fire to WUI residents' lives, the details of their fire-related knowledge, and perceived risk is crucial, we suggest, in developing and communicating fire-related policies or actions that require their support and cooperation. We suggest that before effective communication strategies can be developed on fire or any issue, it is

necessary to understand what one's audience thinks about the salient issue. It is toward clarifying such an understanding that the current research effort is aimed.

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

Literature Review

A number of contextual elements and the experience of stakeholders involved contribute to public views of any natural resource issue (Vaske et al. 2001). Factors contributing to the context of current wildland fire situations include fear of escaped fires, suppression costs, and the adverse effects wildland fire may have on recreational opportunities or area aesthetics (Winter et al. 2002). Other studies show that geographical area, proximity to homes (Brunson and 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 is the level of trust in wildland firefighting organizations (Winter et al. 2004), previous experiences with fire (Winter et al. 2002), fire size (Carpenter et al. 1986), and residents' understanding of fire benefits such as nutrient recycling (Loomis et al. 2001). In response to a perceived lack of trust between much of the public and management agencies such as the U.S. Forest Service, scholars and managers are developing a variety of programs to educate and inform the public about wildfire issues (McCaffrey 2004).

Significant, nationally organized efforts to suppress wildland fire in U.S. forests began after the devastating fires of 1910 (Pyne 1997). The subsequent half-century of suppression activities continued to influence public attitudes until the early 1970s, when Hall (1972) found that the majority of the public believed all forest fires were bad (Pyne 1997). However, starting in the 1970s, studies began to demonstrate the public's willingness to support alternative strategies for fire and contributed to increased focus on allowing fire in the forest, particularly in wilderness areas (Cortner et al. 1990).

Public Support of Fire Management

A number of recent studies (Absher and Vaske 2007; McCaffrey 2006) have found that educational or outreach programs increased fire knowledge and positive attitudes toward prescribed burning or allowing some fires to burn naturally. This includes adaptive programs in areas prone to severe fires (Absher et al. 2006; Vaske et al. 2007). These studies provide evidence of increased public understanding concerning wildland fire and its management, but this is not uniform across the United States (Brunson and Shindler 2004; Kneeshaw et al. 2004; Shindler and Toman 2003; Weible et al. 2005).

Other social science studies concerning wildland fire now focus on 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 the acceptance of management practices. Absher and Kyle (2008) found that WUI residents are very knowledgeable and aware about defensible space activities but do not fully implement these activities.

Recent research about WUI populations indicates that their growing experience with wildland fire leaves them more apt to view fire as a natural part of forested ecosystems that cannot not be excluded in the long run by suppression activities or preventive measures through governmental agencies (Winter et al. 2004). WUI residents apparently assess the acceptability of fuel treatments based on the context of the situation and site-specific considerations, including management agencies' perceived ability to communicate management strategies, professional skill, and credibility (Winter et al. 2002; Brunson and Shindler 2004; Absher and Vaske 2007).

Integrating private homeowners into the management process and recognizing their knowledge and concerns about wildland fire appear to be avenues for increased trust between the public and land management agencies while advancing management of risk through collaborative efforts (Winter et al. 2004; Shindler and Toman, 2003). Collaborative management efforts such as the FireWise Community Program and the thoughtful application of research on effective education and outreach methods (Parkinson et al. 2003; McCaffrey 2004) have the potential to reduce conflicts about public safety by providing a transparent view of agency efforts to protect homeowners and promote forest health. In turn, collaborative approaches allow homeowners the opportunity to express views and concerns about land or fuel management near their homes and provide agencies with local, place-based knowledge about the resource (Payton et al. 2005; Daniels and Walker 2001). The goal of these collaborative activities is a more uniform level of knowledge and commitment to shared management strategies among all stakeholders, increased public acceptance of fuel-reduction efforts, and successful fire management.

Although interactive community education programs such as Firewise are proving to be effective tools, a number of studies suggest that residents think agencies are not attempting or achieving collaborative efforts with the public on fire management (Winter et al. 2002; Brunson and Shindler, 2004). It seems clear that complete agreement among stakeholders will never occur, nor should it, as some diversity of thought stimulates new ideas. However, collaboration that calls on a variety of knowledge bases and experience nonetheless can facilitate the development of shared ideas (meanings) concerning fire and its management (Daniels et al. 1996). Success in collaborative management is predicated on a host of elements particular to each situation, but the shared meanings created in any such process are important as the basis for joint or collective action (Daniels and Walker 2001). It is this assumption that motivates our use of symbolic interactionism.

Symbolic Interactionism

This study uses Blumer's (1969) symbolic interactionist approach to understand the views of wildland–urban interface residents regarding wildland fire and relevant agency management strategies. It places focus specifically on meanings held by study participants concerning (in this case) wildland fire as a source of risk to the WUI or appropriate management actions by agencies and local citizens. Three underlying tenets guide Blumer's (1969) classic conception of symbolic interactionism: (1) human beings act toward objects, defined as anything indicated or referred to, on the basis of the meanings they have toward them; (2) the process of interaction between people is the source of these meanings; and (3) individuals incorporate and handle meanings through a process of communication and interpretation, establishing what objects in the environment are salient and arriving at shared meanings for such objects.

Newer uses of symbolic interactionism view the evolution of issues (such as those raised by fire risk in the WUI) as socially constructed "distortions of enacted structure" in society (Lamertz et al. 2003; Stryker 1980). The resulting failure of existing social order and mutually accepted rules leads to competition for a new structure and the adoption of a new standard for dealing with the objects or issues in question (Weick 1993; Goodin 1998).

A small body of research applies symbolic interactionism to natural resource management (Thomas and Garkovich 1994; Jorgensen and 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. Carroll (1995) also used symbolic interactionism as a way of understanding the attachment of Northwestern loggers to their occupation, way of life, and their disaffection for the "urban majority," who they often believed were out to destroy both.

Although we acknowledge the evolving scholarship surrounding symbolic interactionism, we maintain a focus on Blumer's (1969) tenets because we think that they best encapsulate the process by which meanings concerning wildland fire and its management evolve. This includes fuel treatments, the growing understanding of fire as a natural and healthy part of ecosystems, and a growing belief that local residents bear responsibility for mitigation activities.

In the language of Blumerian symbolic interactionism, we focus on discerning the meanings WUI residents have relative to wildland fire, rather than assuming that they agree with the meanings held by natural resource professionals. This perspective differs from previous studies on the acceptability or support of fire management activities because it focuses on the underlying meanings WUI residents associate with fire on a day-to-day basis. Previous studies of wildland fire acceptance, including some of those cited earlier, have often focused on the attitudes leading to, or the behavioral outcomes associated with, public acceptance or participation in its management. These are useful conceptions, but our intent is to provide another level of understanding concerning the processes underlying these outcomes. Our focus on meanings allows a practical snapshot of what underlies residents' perceptions about fire and provides a broader understanding of how they influence action or inaction regarding its management.

Methods

According to Blumer (1969), any study using a symbolic interactionist approach ideally involves direct examination of the empirical social world. We suggest focus groups are an appropriate and practical way to discover the meanings WUI residents hold about fire and the salience of the topic. They allow for open-ended discussion and detailed explanation of the mental pictures (meanings) participants create in addressing complex issues such as wildland fire. Focus groups also allow the opportunity for participants to clarify their meanings (to themselves and others) through dialogue (Lindlof and Taylor 2002).

We decided to conduct focus groups in the greater Spokane, WA, area because it has a relatively diverse rural population and has experienced its share of WUI fires, the most dramatic of which burned through 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 north

of Spokane, with particular focus on those directly bordering on or in close proximity to U.S. Forest Service or other public lands. Participants meeting these criteria and within a maximum of 52 miles of the focus group facilities were selected to maximize the likelihood that they would travel to Spokane for participation. The mean travel distance for participants was 24.7 miles and the standard deviation was 13.86, indicating significant variance in the type and range of WUI residents we selected. 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. Once location of residence was confirmed, a combination of door-to-door recruiting, doorknob hangers, and using telephone directories to find names on mailboxes was 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.

Three 120-minute focus group sessions were conducted in March 2006. Group size ranged from 10 to 13 participants. Although this is a relatively small sample, we argue that the rigor of the purposeful sample and the visit to each participant's home to ensure their inclusion in the WUI make it a reasonable representation of that population. A professional focus-group moderator led the discussions at specially designed focus-group facilities that included recording equipment and two-way mirrors for focus group observation by the authors. Sessions began with general questions regarding the quality of life in the area and gradually narrowed to topics concerning fire in the forest, fuel management strategies, and the role of management agencies and public involvement in preparing for fires. Participants were told the research concerned management of public lands, but they were not specifically informed of the research topic ahead of time. We did this to gauge whether and how quickly wildland fire emerged as a day-to-day concern in their lives and so that their meanings concerning this topic would emerge naturally (without prompting). The moderator began sessions by explaining no outcome was expected and all opinions were welcome. He asked questions and then let discussion unfold.

We applied a thematic analysis to our data in order to develop relevant themes from patterns observed in participant interactions (Silverman 2001). Thematic analysis is an inductive method for identifying commonalities in personal experience surrounding a given topic and employs a multistep process of coding statements into categories, which are then situated into larger themes (Boyatzis 1998; Aronson 1994). This data analysis method complements the theoretical framework of Blumerian symbolic interactionism by allowing us to focus on the shared individual meanings residents hold concerning wildland fire in their local environment.

We began this process by taking notes during observation of the focus groups and developing initial themes of importance. The senior author then developed codes on fully transcribed accounts of the focus groups by compiling similar quotations on separate documents and making notations about their similarities, a process dubbed the "discovery" stage by Maykut and Morehouse (1994). These themes were discussed with the other authors in order to standardize and refine them. Documents containing each theme were then reviewed and simplified by retaining the most representative quotations and noting the most common overlap in statements by participants.

Results

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 threatened them the most. Participants overwhelmingly listed fire, acknowledging their awareness of the danger 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 the 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 thought about fire seasonally; those who made efforts to reduce possible fire damage indicated that it was 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. Participants first mentioned fire while describing the areas they lived in and outlined excess fuels or 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." Thus, it had become clear early in each of the focus-group sessions that the specter of wildland fire spreading into the WUI was a very salient matter for our participants.

Knowledge/Views Concerning Wildland 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 relationship between fire suppression and the buildup of fuels now driving large wildland fire 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 of 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 regenerates the forest." Others mentioned the natural cycle of burning in pine forests for seeding.

Some participants 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.

The dominant view in all three groups was that it is nearly impossible to eliminate fire danger in the WUI, and participants thought that all landowners involved should place more emphasis on reducing fire danger. 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 prevention.

Participants thought land management agencies had 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 also stated that they would like to be included in the decision-making process if a fire on the national forest threatened their home.

Participants' knowledge of terminology specific to wildland fire management turned out to be less detailed than their otherwise relatively sophisticated knowledge of fire 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 preventive measures, with knowledge of such measures being limited to describing a "greenbelt" of cleared area around the house. As one resident indicated, "I think about protectable space, green space or cleared space." 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."

As we noted earlier, one of our interests was to determine whether WUI residents distinguish between types of fire in their local environment. For example, do they distinguish between uncontrolled wildland fires and the use of prescribed burning as a forest management or hazard reduction tool? Participants cited positive and negative experiences with prescribed burning as a fuels management strategy to explain 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."

The highly publicized 1988 Yellowstone fires were a major reference point for participants' knowledge of fire both as a management tool and a threat. These fires eventually burned more than 800,000 acres of Yellowstone National Park. Though (or perhaps because) the origins and consequences of the Yellowstone fires were multifaceted, the events of that summer created an enduring public debate surrounding the management of fire on public lands. Much of this debate focused on the extent to which fire plays and should be *allowed to play* a "natural" role in forested ecosystems, particularly when human infrastructure is potentially involved (Pyne 1997). 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 wildland fire 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.

Meanings for Fire in the Non-WUI Forest

The focus-group discussions clearly indicated that residents' meanings concerning fire have much to do with a fire's proximity to the WUI. In line with the results of Weisshaupt et al. (2005), we observed, across all three groups, very different meanings for 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.

Participants' meanings concerning fire in the backcountry went well beyond old conceptions of fire as dangerous or detrimental to include possible benefits of fire such as clearing excess brush and creating wildlife habitat. This is an extension of the general theme we described earlier and one that we contrast later in our discussion of fire meanings in the WUI. 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 backcountry fires burn without human intervention, though indications of support were dependent on scenarios where the prescribed burn was not in close proximity to homes. 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 that this practice was particularly useful in areas that receive little human visitation or recreation: "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 an example repeatedly raised by participants, without moderator prompting, associated with the beneficial nature of letting some fires burn in the backcountry. As one resident explained,

> I think of Yellowstone, where people thought 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.

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.

The majority of participants also advocated fire mitigation strategies such as prescribed burning 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 that threatened deeded private property where all animals (including wildlife) and residents had been evacuated. Although some were resistant to the idea, the majority of residents thought naturally occurring fires like this should be allowed to burn and human-caused fires suppressed. 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."

To summarize, our participants generally viewed fires burning far from human habitation as a natural and important part of the forest. Such fires were viewed positively and they tended to describe fire *benefits to the forest* rather than *perceived dangers and destructiveness*.

Meanings for Fire in the WUI

As alluded to earlier, participants' meanings for fire in the WUI were strikingly different from those concerning fire outside the WUI. Discussions on this topic included more fearful language and often-stated preferences for cautious use of fire as a management tool around areas of human habitation. 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 or 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 the WUI centered on fear of property loss, injury of loved ones, and wind speed. Direction and smoke were other closely associated phenomena. Another participant reported his reaction to a nearby fire: "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."

Participants' meanings concerning fire in the WUI also included images of defending their property and helping neighbors threatened by it. Participants with community wells expressed concern over the availability of water needed to protect their properties during fire and others indicated they would help neighbors evacuate or establish defenses.

Participants mentioned previous fires in the area as an example of the scope and severity of fire and of 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. This event was repeatedly 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. Defensible space emerged independently of direct questioning, and participants described the strategies they take to alleviate concerns with living in forested areas. They described proper resident management or firefighting as the removal of excess brush around the home and reducing the occurrence of crown fires. As one participant 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.

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,

> 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 WUI residents have an inherent responsibility to ensure that their land does not add to the potential danger of fire in the WUI. They 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 5 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.

It is fair to say that the meanings associated with fire in the WUI were both very different and more complex than was the case for uninhabited areas. Meanings focused on the *destructive potential* of fire to people, animals and human infrastructure and the need for residents to *defend against* such destructiveness both before and during fire events.

Discussion

Our results reflect an apparent shift away from views of wildland fires as a destructive force alien to the forest and toward fire as a "normal" process in forest ecosystems. They also indicate that fire has become an important and frequent concern of WUI residents. However, participants expressed very different meanings concerning fire when it is at a distance—burning in uninhabited forest—versus when it is a tangible threat to their own and other's property. Wildland fires burning on backcountry lands or forests far from residential areas are more likely viewed as a natural process and one that can benefit 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 (to put it mildly) in and around the WUI.

Our results have a number of applications for management. First, the apparent growing sophistication and understanding of wildland fire in WUI residents' minds (at least among our participants) suggests that we have reached the time to initiate greater collaboration in decision making concerning fire in the WUI. Our results also indicate that projects by land management agencies could well incorporate more information on defensible space and local knowledge about fire conditions. In light of these results and those from other works noted earlier (Parkinson et al. 2003; McCaffrey 2004), it is in the best interests of all stakeholders to work collaboratively to establish common understandings about wildland fire risk and management. Such approaches appear to have the capacity to increase trust between agency officials and resident, which can in turn lead to better and more socially legitimate management decisions (Winter et al. 2002; Brunson and Shindler 2004).

It is also useful to recognize that increased support for prescribed burning or allowing natural fires to burn for reasons of ecosystem health are context specific

and will not meet with support in every location. Our results amplify those of Weisshaupt et al. (2005) and others that indicate that these practices will be met with much more scrutiny and fear when conducted in the WUI than when carried out in the backcountry (this despite these residents' relative sophistication about fire generally). The results also suggest that any prescribed burning in the WUI that is attempted would need to be carefully coordinated with local stakeholders. Management strategies near homes or the WUI are of particular sensitivity, and it is important that managers evaluate existing efforts to inform and work with homeowners in advance about the risks and likely benefits involved. Also important is clear communication about which entities have responsibility for which management and protective actions in which areas (i.e., structures, private property, local town property, state/federal land, etc.).

Second, managers interacting with WUI residents concerning these issues might consider putting special focus on large and particularly memorable fires such as the Southern California fires of 2003 (Cedar Fire) and 2007 (Witch Fire) or the Yellowstone fires of 1988, the latter of which was a particularly salient point of reference for our participants. Managers should recognize that the visibility of these fires makes them particularly useful fire management lessons. The Yellowstone fires (and we might assume those in California) have become, for our participants at least, a metaphor for a more complex understanding of the role and the inevitability of fire in the WUI.

Third, shared understanding is an important factor in collaborative management between agencies and private homeowners; it is also important to residents' increasing desire to establish personal defenses (Absher and Vaske 2007; McCaffrey 2006). At the time of our research, our participants, although relatively sophisticated about wildland fire in general, did not understand enough of the scientific and technical terminology to contribute as meaningfully as they might otherwise to fire management discussions and decision-making. Inconsistent and/or incomprehensible use of terminology by managers in dealing with the public is well documented as a barrier to effective participation in collaborative processes (Slovic 1999; Palenchar and Heath 2007). Thus, it would appear that managers might make more efforts to be more judicious in their use of technical fire terminology when dealing with the lay public, and when it is used, make sure that it is carefully defined and understood.

On the other side of the coin, managers might find it useful to know that recent, highly publicized incidents of escaped prescribed burns have not necessarily "poisoned the well" for future use of fire as a forest management tool to bring forests back to more "natural" conditions. Our participants had a strikingly nuanced view of all this and clearly saw a role for wildland fire in backcountry situations. However, there is still a high amount of anxiety and hesitation when that type of fire begins to encroach on homes in the WUI. Managers and citizens together must find the balance between these perspectives given the context of their management objects and be aware of the additional complexity that is inherent in dealing with prescribed fire or letting some fires burn near or in the WUI. An argument can be made that at least some WUI residents have a more sophisticated view of fire than natural resource managers have of them and their knowledge levels and willingness to work collaboratively to address fire risk.

Conclusion

Results from this study suggest a view of the WUI as a diverse population of homeowners beginning to understand the relationship between wildland fire and the land

on which they live. Shared meanings related to fire are changing to include positive benefits and the role of fire as a natural process, though there are some lingering perspectives remaining from the era of fire suppression. These changes indicate WUI residents are at a crucial stage in their development as competent contributors to fire management in the WUI.

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