The Place of Fire

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In the past five years, the western United States has incurred increased economic and social

costs due to wildfire. In this time period, thousands of structures have burned and billions of

dollars have been spent on fire suppression. In 2002, the National Interagency Fire Center

indicated that costs to federal agencies engaged in wildland fire suppression amounted to $1.6

billion, with losses including 6.9 million acres burned and 2381 structures burned.[1] The impacts

of wildfire are increasing for three primary reasons: (1) a history of fire suppression has led to

increased fuel loads, (2), fire potential is worsening due to drought conditions, and (3) the

population and density in areas of high fire risk is growing and the square mileage of the

wildland urban interface (WUI) itself is growing rapidly, as more people seek to live

nonmetropolitan areas (Johnson and Beale 1994) and near amenity-rich areas, particularly the

areas around federally managed land (Frentz et al 2004).

This project initially began with intent to explore the role of institutions and organizations

and their efficacy in motivating homeowners to implement fire risk reduction strategies. It was

assumed that the involvement of organizations and institutions working to reduce fire risk in

WUI communities had somehow changed the landscape of fire risk response in such a way that it

would be possible to learn something qualitatively about what role government programs or local

organizations were playing in informing or motivating homeowners to take action in response to

fire risk. In this paper, however, I explore the role of "place" and "place attachment" in

homeowners' decision-making processes around the adoption of risk reduction strategies.

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[1] The costs for wildland fire suppression in 2000 were 1.36B; 2001= 917.8 M; 2002= 1.66B; 2003= 1.32B]
http://www.nifc.gov/ (6/2004)

"Place" and "place attachment" emerged as a salient and unexpected theme in the course of conducting interviews initially focused on the role of institutions in shaping mitigation behavior.

The recent wildfire situation has led to increased research into the public response to the wildfire threat, but little attention has focused on homeowners' willingness to engage in self-protective action and their perspectives on fire risk or their decisions to adopt measures that may reduce the risk of loss due to wildfire. Interviews conducted in the summer and fall of 2003 in five Colorado WUI communities indicate that rather than constituting simple, unidimensional decisions to reduce risk levels, decisions to implement landscape level fire mitigation measures are complex. Respondents indicated that these decisions involve complicated social and emotional processes that are connected to the very reasons people choose to live in forested mountain settings. The emotional aspects of these processes were not principally associated with fear of wildfire, but rather with the intersection of attachments to social and environmental conditions and the difficulty of negotiating these in the face of wildfire risk. Thus, rather than addressing wildfire as a management issue or as an objective risk, fire must be understood within in terms of residents' own perspectives and priorities.

Wildfire Research

To date, social science research concerning wildfire research primarily focused on exploring public acceptance of forest and fuels management approaches on public land (Brunson and Shindler 2004; Cortner et al. 1990; Kneeshaw et al. 2004; Taylor and Daniel 1984; Winter and Fried 2000). While public opinion of management agendas is important for successful implementation of public land management strategies, it is only one issue within the fire management dilemma in the wildland urban interface.

The WUI is defined as the "line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels" (USDI/USDA 1995). Such areas tend to be particularly prone to wildfire because in addition to the fuels associated with the public lands, there are typically substantial fuels on adjacent private properties. The "interface" area is growing in size and density, and wildfire research lacks a systematic understanding of the decisions homeowners make around the implementation of risk reduction strategies on their private lands that are adjacent to or surrounded by public lands.

Research on homeowners' perceptions and behaviors has contributed somewhat to understandings of homeowners' response to wildfire (Gardner and Cortner 1988; Gardener et al. 1987; McCaffrey 2002; Russell et al. 1995). However, this research is unable to explain why so many homeowners facing high fire risk in the WUI are not mitigating in accordance with technical assessments of the risk they face. This problem continues to confound fire and forest managers whose mandate increasingly involves efforts to convince homeowners of the importance of their participation in fire risk reduction strategies.

Until recently, wildfire research has generally remained outside of the domain of the natural hazards literature and the natural hazards research community itself has only peripherally considered wildfire risk. A few wildfire researchers are beginning to integrate hazards considerations (McCaffrey 2002; Kumagai et al. 2004); however, this work is limited and has yet to fully explore the applicability of hazards findings to the wildfire context.

Hazards Considerations

According to almost 30 years of hazards research (focused largely on hazards other than wildfire) choices of mitigation measures are conditioned by social factors rather than hazard-specific factors (Lindell 1997). In addition to significant demographic characteristics, important

social factors include residential tenure as well as community characteristics and dynamics (Lindell 1997). People with long-term community relationships, homeowners, and those with high levels of social involvement in their communities are more likely to adopt hazard adjustments and is thought to be related to community attachment (Edwards 1993; Russell et al. 1995). Community attachment is influenced by length of residential tenure, homeownership, and the presence of school-age children (Tierney et al. 2001). This attachment reflects the identification of neighborhood or community as home, participation in community organizations, and presence of friends and relatives nearby, and significantly correlates with hazard adjustments (Turner et al. 1986).

Greater social interaction with community members and participation in community events may be related to hazard awareness (Lindell and Perry 1992). This may be particularly true for fire hazards, as community organizations in the WUI are currently being targeted by wildfire specialists and forest managers for fire education programs. Research indicates that community attachment, or sense of community, increases neighborhood relations and increases the sense that one has the ability to affect what is happening in their community and around their homes (Chavis and Wandersman 1990). Sense of community is also important because it provides a type of empowerment that motivates people to become involved in efforts to address shared problems (Chavis and Wandersman 1990). Though little systematic research exists examining how participation and involvement in community events or how contact with community members influences the adoption of hazard-related risk reduction measures *before* a hazard event (Tierney et al 2001), it is likely that participation in local activities or associations effects the amount and types of information people receive; and this may influence actions taken to mitigate the impact of hazards.

The hazards field has also explored perceptions of mitigation options available to mitigate the impact of hazards and found that the efficacy of mitigation in reducing effects of a hazard, time and cost associated with implementation, awareness of the hazard, and knowledge needed to implement mitigation options all affect likelihood of implementation/adoption (Davis 1989). What has been missing from such explorations, however, is how people perceive different adjustments and what makes some adjustments more 'attractive' or likely to be implemented than others (Tierney et al. 2001). How do people understand generic prescriptions to reduce risk and their applications to their parcel of land, their situation, or their context (Tierney 1999)?

Place Considerations

While hazards research has found that community attachment is positively related to the adoption of mitigation measures, attachment has only been assessed using crude measures such as length of residence as a proxy measure. Research regarding place attachment more generally indicates that places, particularly places with aesthetic qualities such as the WUI, are not simply spaces or blank backdrops within which human activities take place (Brandenburg and Carroll 1995) instead, places are imbued with meaning that create or increase emotional ties (Cuba and Hummon 1993).

Place-related research provides more nuanced understandings of social factors, such as community attachment (Giuliani and Feldman 1993, Kaltenborn and Williams 2002) than are commonly drawn upon in hazards research. Some alternative ways of exploring community attachment explore relationships between: community activities and place attachment (Low 1992); place meaning and behaviors that are considered appropriate in that place (Low and Altman 1992, Cheng et al. 2003); experiences in a place and identity (Cuba and Hummon 1993).

Cumulatively, this work points to important dimensions of community attachment that may

need to be explored in a hazards context. As related to the inquiry here, attachment to physical or natural places may provide more complex and nuanced insight into factors shaping hazards response in an amenity-rich setting than a simple measure residential tenure or social interactions. In all, place literature suggests that the relationships people have with the physical environment are important and may shape behavior. However, the link between place attachment and response to hazards has yet to be made.

Importantly, a notable portion of place literature explores the link between place attachment or sense of place and related attitudes and behaviors. When viewed favorably, attachments to natural environments can contribute to community attachment (Brehm 2003). Emotional connections to natural settings are related to notions of, and behaviors related to, environmental responsibility (Vaske and Kobrin 2001). Place attachment also appears to be related to attitudinal outcomes regarding resource management and behavioral outcomes such as adopting risk reduction measures (Kaltenborn and Williams 2002, Vaske and Korbin 2001, Vorkinn and Reise 2001). Views on management of natural places have been found to be related to strength of attachment to a place, rather than to residential tenure or status (Kaltenborn and Williams 2002) indicating that strength of attachment may be more complex than the measures in hazards literature have allowed. Research in this area has contributed insights into the importance of sense of place and place attachment on perspectives on land/resource management (Brandenburg and Carroll 1995; Mitchell et al., 1993; Williams and Stewart 1998) and may be particularly helpful when considering the intersection of natural hazards associated with resource management. Place literature illuminates the ways in which hazards assumptions and measures may be improved by considering the important relationships that homeowners have with the social and environmental aspects of the places in which they live.

Setting and Methods

Larimer County, Colorado

This study focuses on WUI communities in Larimer County, Colorado.   Almost 50% of Larimer County is composed of public lands the majority of which is managed by the National Forest Service and National Park Service. An abundance of public land is one of the amenities that makes Larimer County an attractive place to live. Census data indicate the county has almost tripled in population since 1970 and has increased almost one and a half times between 1990 and 2003 (U.S. Census Bureau-1995; 2004). Counties in the interior West, particularly those close to national forests are seeing above average population growth rates (U.S. General Accounting Office 1999) and that urban encroachment constitutes a substantial threat to national parks (U.S. General Accounting Office 1994). As urban areas develop near fire-prone areas, the build-up of fuels due to decades of fire suppression policy constitutes a greater threat to lives and property (U.S. General Accounting Office 1999).

In response to increasing fire concern, Larimer County stands out for its concerted effort to address wildfire in the WUI communities most immediately exposed to wildfire threat. The Larimer county fire plan contains six components: prevention, preparedness, mitigation, suppression, reclamation/rehabilitation, and fiscal issues (Simons 2004). In this study, the mitigation component is the primary focus.

Communities and Sampling

Target communities and initial key informants were selected with the assistance of the Larimer County Wildfire Safety Specialist (CWSS). The CWSS spends extensive amounts of time working in wildland urban interface communities in Larimer County. Five communities were chosen in order to select a wide range of mitigation activity levels in response to wildfire

risk as well as proximity to past large fires, and differing community and organizational characteristics such as proximity to urban areas, average lot size, and numbers and types of community organizations.

The communities targeted in this study have been assessed for community-level fire risk, and all communities have had contact with the CWSS and had community leaders who were in contact with the Colorado Forest Service and local fire departments. Individuals considered community leaders due to their active roles in community organizations and activities were identified by the CWSS and contacted for in-depth, semi-structured interviews. These interviews were intended to pursue individual-level perceptions and behaviors regarding wildfire and fuels mitigation of each community leader and community level information regarding local social organizations, community composition, and other information such as experiences with fire and contact with agencies. During interviews with community leaders contact information was solicited for residents who have and have not engaged in fire mitigation on their property.

This purposive sampling technique made it possible to select respondents based on knowledge of the communities and purpose of the study (Babbie 2001). There were several advantages to this sampling approach. Most importantly, the experience and work history of the CWSS made his expertise invaluable to this research endeavor. The CWSS is an expert in wildland fire and the threats to WUI communities whose work on wildland fire issues occurs at the community level and with individual residents. Additionally, his experience makes him a reliable expert in identifying key informants who can report on both community and individual level fire mitigation activity. Each interviewee was asked to name who they would consider to verify the insights of the CWSS and to ensure that there were not other activities or leaders of which he was not aware.

The approach was intended to facilitate recruitment of a group of study participants with a wide variety of perspectives. Still, it did not result in generalizable findings due to the non-random nature of the sample. Even so, results are important because the provide insight into the perspectives of residents facing wildfire threats and the decision-making processes involved in deciding whether or not to implement mitigation measures.

Participants and Interviews

In total, twenty-nine interviews were conducted with 35 study participants representing 30 distinct households. The age of respondents varied from mid 30s to mid 70s with an average age in the early 50s. All respondents were White, with one Hispanic.[2] Nineteen of the participants were women and 16 were men. While most of the interviews were one-on-one, 5 couples were interviewed together.

Interviews lasted from 45 minutes to 2 hours. All interviews were audio taped and later transcribed. I also took notes during the interviews and inserted these into the transcripts during transcription. Twenty-two of the interviews were conducted in the respondents' homes. The other seven interviews were conducted at participants' workplaces (3) or public places such as a coffee shop (1) and restaurants (3) in order to make the interview as convenient for the participant as possible. One advantage of conducting the interviews in respondents' homes was that the study participants were able to not only describe, but to point to and show topographical considerations and land use conditions, and to discuss proximity concerns. Notes regarding the physical context were included in interview transcripts.

All interviews opened with general questions regarding fire, fire mitigation and fire risk. This allowed study participants to define the issues that were most salient in their understanding of, and response to, wildfire in their community. After an initial dialogue in which the

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[2] Larimer County is 91.4% White and 8.3 % Hispanic according to US Census 2000.

participants' primary concerns were explored, the interview transitioned to a semi-structured

approach using an interview guide. Information was collected in a conversational style, allowing

the respondent to explain relevant information related to key themes that included:

- History of residence;
- Experience with wildfire;
- Knowledge of wildfire risk before and after moving to the WUI;
- Knowledge of mitigation options;
- Mitigation activities and motivation;
- Perspectives on fire risk, insurance, and responsibility for fire hazard mitigation.

Data Analysis

While the project began with a set of semi-structured questions, the interview guide was

purposefully designed to be flexible; as issues emerged from interviews, they were incorporated

and pursued in subsequent interviews (Fontana and Frey 1994). Previous interviews were

reviewed before the next interview was conducted, allowing for question changes. In order to

explore the salience of emerging themes, significant areas of concern identified in previous

interviews were pursued in subsequent interviews. This approach allowed for the emergence of

themes that could not have been predicted and were not initially included in the interview guide.

The qualitative software tool Nvivo 2.0 was used to manage the interview data. Open coding

was used to capture issues or concerns that arose during interviews and organize issues into

initial categories (Strauss and Corbin 1998). The interview text associated with codes that

reoccurred frequently was compared and contrasted in an effort to understand the dimensions of

the issue associated with the developing categories. These categories were organized and

developed as a way to organize key issues and ideas, and to identify subsets of significant ideas

that indicated either degree of importance or nuance of description. As the process of data

collection and analysis progressed, selective or focused coding was used to further develop and

refine categories (Lofland and Lofland 1995; Strauss and Corbin 1998). These categories form the basis of the themes presented below.

Findings

Analysis of the interview transcripts revealed an interesting and unexpected story. As indicated above, the research plan was designed to allow the significant concerns among participants to shape the direction of the project. Respondents consistently stressed that factors other than fire information or incentives provided by local or governmental organizations were more important to them in making mitigation decisions. Using open-ended questions and a semi-structured approach thus allowed the participants to identify the salient issues, and these issues became the research focus.

These interviews reveal that the meanings that are associated with the experiences and expectations of living in the WUI play an important role in how wildfire and fire risk are characterized and how the variety of possible responses to wildfire risk fit into the social and environmental context of a WUI community. The homeowners interviewed consistently stressed three themes: (1) social aspects of place attachment, (2) environmental aspects of place attachment, and (3) the appropriateness and applicability of mitigation options. The findings are presented according to these three primary themes.

Social Aspects of Place Attachment

Community

As indicated earlier, attachment to community has been found to be positively correlated with the adoption of self-protective actions. Community attachment in hazards research, however, has primarily been addressed through social measures that can easily be measured through survey tools such as residential tenure, social involvement, and the presence of family

and friends in the community. Community attachment can also be conceptualized in terms of the meanings associated with, and the feeling experienced in the development of, a relationship with a place. These interviews give voice to the importance of these meanings and feelings associated with the social aspects of place attachment.

A few of the respondents indicated that they moved to their particular community because they already had friends in the community or found property because friends had contacted them about available property/homes for sale. Several respondents discussed the importance of community characteristics in their decisions to move to the WUI. These WUI communities were described as having a "small-town feel," as being the types of places that would be good to raise a family – in part, it appears, because people have a sense that residents have similar values.

Respondents also tended to characterize others who live in these types of mountain settings in particular ways, as people like themselves, or at least people with whom they could share a community. Carrie[3] (mid 40s, 5 year resident) who runs a business out of her home explains: *Most of the people who are up there are on the same page as to why they are up there.*[4] Justin, a local firefighter and eleven year resident explains:

> *You know, there is a community, it is not very big, it is very laid back, uh, not any kind of pressures, no nothing, it is just people are very good and that doesn't seem to ever change even though people do change occasionally...*

Respondents described themselves and other WUI residents as independent, resistant to being told what to do, private, and lovers of nature. Cynthia (52, 6 year resident), a health educator who commutes to work in Boulder explains: *I know about the independent nature of people who live up* [here] *that will never do it, they will never think that anyone should force them to do* [mitigation]. Irene (70s, 20 year resident), a community leader explains that the importance of independence reflects feelings about the government:

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[3] All names are pseudonyms.
[4] Some quotes have been shortened or condensed for ease of reading. Ellipses indicate if any text has been omitted.

… of course everyone hates government, I mean everyone hates government. They hate the federal government, they hate the state government, they hate the local government.

The ways in which the respondents portrayed their WUI experiences suggests that attachment to place is much more complicated than residential tenure- rather, it also involves social assumptions about where one is living, what kind of people are part of the community, and social expectations regarding attitudes and behavior.

Socio-Environmental Conditions

Aspects of social context appear to be social values are made possible in the WUI context through biophysical or environmental conditions associated with WUI space. Attachment to social place appears to be conditioned, at least in part, by a sense of shared social values. Two particularly important themes, privacy and independence from regulation, emerged from the interviews as social conditions or social norms that characterize these WUI communities. What is equally important for the purposes of this study is that they are social conditions that are made possible or facilitated, at least in part, by the environmental conditions of the area. Thus, these conditions are more appropriately thought of as socio-environmental conditions because it is clear that while the social ethic of privacy, for example, appears to be widely held, that ethic is more easily maintained in part because of the physical space, type of terrain, and forest cover that exists in these communities.

1) Privacy

Privacy in the WUI is not simply attained through a mutual respect for social distance, but is achieved through the establishment of physical distance. Steve (late 40s, 15 year resident) a retired entrepreneur and volunteer fire fighter explains:

…And, the difference is, is that you don't have people stopping by. If somebody wants to talk to you, they call you first and… then you can agree to meet. So you can, you can go for days on end and… not see anybody, if you, if that's the way you wanna be… but, you don't have to. And so, we've got the best of both, both worlds here, when you do that.

While in some apartment-building or suburban settings it may be appropriate to knock on a neighbor's door for the proverbial cup of sugar, such an action in these communities would be considered more unusual. Bob (42, 7 year resident), an east coast transplant describes the differences between living in urban and rural settings:

> *And it is nice not to be on top of your neighbor. I mean, we are friendly to people, we say to "hi" to some people and are friendly with other people, and some people know to keep their distance or they mind their own* [business]. *They come up here to not be bothered, some people, but we are not like that, we are involved in the community and everything and I like just not being on top of people.*

While all respondents indicated that they preferred the WUI context because they are out in nature, it is clear, however, that the residents interviewed were not under an illusion that they were beyond the confines of society. Arlene (55, 23 year resident), a mother of three explained:

> *I love the quiet, I love the natural habitat, the animal life, the starry skies. Ah, kind of, the idea that you are out in the wilderness even though you are not.*

Despite this recognition, the space and broader vastness of surrounding public lands allows a sense of being isolated. George (9 year resident), retired software engineer, explains:

> *Yeah, I mean, we have plenty of space and we don't have a curtain on this house because nobody can see in. We have the bathroom over here and we have a little glass thing there that is frosted so that gives you the privacy from the driveway area, but other than that, there is no window covering here.* [laughs] *I have visitors downstairs in the spare bedroom, so I have thought a little about it* [laughs, heartily] *but there is nobody walking by!*

It is clear that environmental conditions facilitate, allow and perhaps even enforce the social ethic of privacy. Sara, a retired teacher (60s, 7 year resident) explains the characteristics of her mountain top home: *We like the mountains, we like the country. We like the privacy, we like the quiet and the beauty.*

2) Independence from Regulation

Wrapped up in the issue of privacy is the issue of independence from social and governmental regulation. WUI space is assumed to be marked by fewer social and governmental constraints than other settings. Similar to privacy, this freedom from social regulation achieved,

in part, by the space between people and their houses, and by the social norms that mandate that one keeps to one's own business.

Les, (40s, 8 year resident) a former wildland firefighter and horse owner explains that this type of freedom from regulation includes what you can do on your property:

The quiet. [laughs] *The views, just being out in nature. Being able to have room to kind of do what I want, things you can't do in the city, like leaving my junk truck out there and that kind of stuff...*

It is clear that many people feel that WUI space is less regulated such that they may make different choices than in more urban spaces. This sentiment, however, is not shared by everyone, and it is apparent that there is conflict regarding assumptions about what behaviors are appropriate in the WUI. Bob (42, 7 year resident) again shares his perspective:

... people think when they move to the mountains, that they can just have dogs and let them wander and let them bark and, you know, they don't think there are any rules here, that is a negative that is hard to control...

And George (9 year resident) who moved with his wife to their WUI home when his children went to college suggests that there are differing perspectives about the degree to which regulation plays a role in WUI communities. He asserts: *... some of the people that think that because they are in the "mountains" that anything goes...*

Clearly, not everyone saw *only* the positive aspects of small communities in rural settings. Respondents indicated that there are existing and perhaps increasing conflicts regarding understandings of social expectations around issues of regulation. Some described the population as generally socially and politically conservative and several talked at length about the problems of "small-town politics." Interestingly, the complaints about small-town politics typically included descriptions of violations of privacy or the imposition of types of resisted regulation.

Conflicts such as these may be increasing due to growing and changing WUI populations as well as increasing population densities. Further, conflict regarding regulation may become more

intense as wildfire gains the attention of homeowners because wildfire does not simply occur on a parcel-scale (individual property), but rather occurs on community or even regional scales. This is particularly true in communities with steep or dramatic terrain or communities in close proximity to public lands. What one does on her/his land (and this includes neighboring public lands) affects her/his neighbors' fire risk.

Environmental Aspect of Place Attachment

Environmental conditions not only function to achieve certain social goals, but also are meaningful in their own right. Perceptions of the biophysical landscape reflect deep attachments to the landscape and to the environmental conditions that make their houses in the WUI, their homes. Homeowners were keenly aware of the details and environmental conditions of their properties and that of surrounding areas and described the importance of these conditions in their emotional attachments to where they live.

Respondents explained that motivating factors to move to, and live in their communities included both the lifestyle as well as the desire to be near nature. Steven (mid 40s, 4 year resident), a relatively new resident who inherited his mountain property explains how he and his wife feel about their home: *…the two of us have come to appreciate just the wonderfulness of being here. We like it for the scenery and the tranquility and it is a very peaceful community.* Jim (late 50s, 8 year resident), a local business owner explains his attachment to his home and setting:

> *I like the tranquility of… our house. I like the design of our house, we built it for us, not to re-sell, just for us. I think the beauty of it, the chance to see wildlife on a regular basis whether it is bunnies around our Jacuzzi… we see … bobcat and bear and elk and deer on a regular basis, so it is nice.*

Others explained that living in the WUI affords them a type of physical space that made them feel differently than living in urban or suburban areas. Justin (11 year resident) explains how his home is situated in relation to neighboring public land:

I have basically, three and a half million acres of land [laughs heartily] *in my back yard, you know. You just walk straight back through here into Rocky Mountain National Park* [motioning to back of house]*,… and it is not too bad a walk and all kinds of wildlife and everything.*

Respondents reported enjoying walking, hiking, camping, photography, fishing, watching wildlife, and just enjoying the outdoors. Living in such scenic, recreation-rich location is not only about activities, but about lifestyle issues such as general peace and quiet and always having a beautiful view. Linda (late 50s, 12 year resident), a retired teacher and member of the Home Owners' Association board in one community explains:

Just, being an outdoor person and loving to do everything whether it is hiking in the summer, skiing in the winter, um, the beauty of it, and every morning we take the dogs for a walk and we just go 'we can't believe we live here,' you know, it is just such a gorgeous place and, um, also I think [about] *being out of the rat race in the city…*

The benefits of living in such scenic areas were easy for respondents to discuss. They could talk extensively about their first impressions, their pastimes, and their appreciation of the area. When asked to address the downside of living in these areas, despite talking about issues such as the availability of water in the summer, icy roads in the winter, small town politics, and the growing population, it appears that for the respondents these concerns easily were outweighed by the daily enjoyment of the area. Burt (late 40s, 15 year resident), who commutes daily to a local city for work explains:

Yep, it is all about tradeoffs. We live here because if you make any kind of money, you work in a stressful environment at least some of the time and this place is just peaceful. You go for a walk down around this circle early in the morning and all you hear is the creek 1000 feet below you and maybe some bird, but that is it. You may have to shoo some deer out of the road that are blocking your way, but that is it. We… don't have any pets and we are a highway, over this ridge down to the creek below, a highway for deer, bear, mountain lions, just about all the animals that travel through here. It is just amazing here.

Fire is described as just one of many inconveniences and only a few indicated that it was a particularly significant concern. Sara (60s, 7 year resident) explains her perspective on the wildfire threat in WUI life:

> [Fire] *is a constant part. You are always aware of it. I mean, in the winter I am clearing and in the summer I am weed-whacking and you know, making sure I have everything prepared and in between we are* [laughs]*, getting stuff filed and organized and getting pictures on disk so that, you know, if there is a fire, we can get out fast.*

It is clear, however, that even among those that feel that fire risk is very threatening, the threat was not something they were unwilling to live with in order to remain living in their homes or on their properties. Lindsey (early 40s, 3 year resident), a computer analyst and active community member, whose roof houses a community fire siren explains:

> *Oh yeah. It is just that something* [risk] *is everywhere. In the east it was hurricanes, in the northeast it's ice storms, and in the west, where I grew up in California, it was earthquakes. It is gonna be something everywhere. There is no way you can live where there isn't some kind of threat.*

Thus, while wildfire may be the most prominent issue in the minds and agendas of forest and fire managers, for residents of the WUI, wildfire is a part of a much more complex social and environmental landscape that often carries profound emotional meaning.

Appropriateness and Applicability of Mitigation Options

Understanding the dimensions of the social and environmental aspects of place attachment among residents may also provide insight into perceptions about the appropriateness and applicability of available mitigation options to reduce wildfire risk. Most interviewed were able to quickly list the non-landscape level household adjustments they had undertaken including developing an emergency evacuation plan, documenting valuables for insurance purposes, and making structural changes such as replacing roofs with more fire resistant material when financially feasible.

Response to landscape-level mitigation options that involved the reduction of fuels on their properties, however, indicated that assessing the appropriateness of these measures was a much more complex process. Those interviewed appear to be considering the appropriateness of implementation of these options, the potential costs and benefits of implementation of mitigation measures on their properties. These included financial costs and benefits as well as those related to anticipated changes in the sense of place that they might experience with alternations of the landscape. Further, the decision-making process often involved whether or not mitigation options can be adapted or modified to fit within those landscapes.

Importantly, Respondents indicated that deciding how to respond to fire risk is more complicated than simply understanding the risk or knowing about potential risk reduction measures. Complicating factors include the high degree of uncertainty regarding the likelihood of fire, the potential severity of a fire, and the efficacy of mitigation measures to successfully prevent damage or losses in the event of a fire. Importantly, mitigation was often described as a compromise to environmental conditions of mountain properties. Andy (late 30s, 2.5 year resident), a young professional who reflected that he was keenly aware of the fire issue when he moved to his home, explains:

> *...my feeling about fire is that... if a fire is going to race through our area and it is going to destroy all our trees and just cinder block the whole thing and leave our house... well, take our house. I have no interest in living in a moonscape for the next several years and certainly the next 20 years until the trees really come back. ... I also recognize that fire is regularly a part, I chose to live in the woods, I chose to surround my house with a whole bunch of really sappy fire-ready trees* [smiling] *and we try, of course, to trim them back and take out the second and the third trees and what not and keep them away from the house, but, part of it is part of the terrain.*

Clearly, decisions about mitigation reflect residents' feelings about the physical beauty of their environment as well as their role in, and relationship to, the natural environment. Deciding the appropriateness of available mitigation options for their specific properties necessarily included feelings of place attachment and notions of what it means to live in a particular forested setting.

Burt and Noreen, a couple that moved from Illinois 15 years ago (both late 40s) explain that part of their resistance to mitigation is related to their sense of environmental ethics and their reasons for WUI living:

> Burt: *The only thing that I can't get myself to do is to cut down a perfectly healthy growing tree.*
> Noreen: *Oh, we don't want to… that is why we live here, we want to live in the forest* [laughs].
> Other respondents reported balancing out the desire to maintain valued social and

environmental conditions by modifying and adapting options and creating acceptable mitigation strategies. For example, many respondents explained that they had emergency mitigation strategies as way to maintain preferred conditions until an actual fire event demands alterations.[5] These last-minute mitigation plans, which involve removing possible fuel sources only when the property is directly at risk from fire, are intended to deal with sources of fire risk that residents are unable or unwilling to compromise during times of normalcy. Carrie (mid 40s, 5 year resident), an active community member explained that she didn't plan to do any more mitigation other than annual maintenance of raking pine needles and thinning some trees: *Unless there's a fire, I mean if we have one coming, we'll thin… Yea, we will do an emergency thinning* [chuckles].

Such modification of recommended mitigation strategies indicates the threat of wildfire is being balanced out with other priorities. It also indicates assumptions that during a wildfire event and evacuation there will be sufficient time to address the remaining sources of fire hazard. Several respondents acknowledged that this may be a gamble that they might lose if they are not at home during an evacuation or if there simply isn't enough time to take the planned mitigation actions. Cynthia (52, 6 year resident) explains her reasoning:

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[5] See Lindell and Perry 1992 and Tierney et al. 2001 for discussions of emergency or expedient mitigation strategies.

> [These] *things are two pronged... you kinda* [sic] *want to keep the ambiance the trees give you and that feeling they give you, to take the big ones down just on the threat of a fire, that it could happen sometime... is something we are just not willing to do.*

The willingness to engage in such strategies indicates that these homeowners may not have an accurate understanding of the speed at which a wildfire can travel in high fuel-load conditions. Importantly, however, it indicates the degree to which they value the maintenance of the characteristics of their properties that provide a sense of place.

Conclusions

Decisions around whether or not to implement a variety of wildfire mitigation options are complicated. Homeowners living in fire prone areas experience important attachments to social conditions, environmental conditions. While hazards research will bring invaluable insights and guidance to improve wildfire research, its disregard of the places in which people make decisions and the varying impacts of mitigation efforts on social and environmental landscapes leave it lacking clear answers to the conundrum of why people do not mitigate to reduce risk at levels sought by fire and forest managers.

These findings highlight the need to understand the social and environmental aspects of place attachment that may complicate decisions around how to respond to natural hazards. Further explorations of how socio-environmental conditions are defined, met, and upheld through the environment may provide an interesting lens through which to consider populations who are less willing to mitigate than expected in the face of risk. The voices heard in this study illuminate the importance of bringing together hazards and place research in the effort to understand hazard response in wildfire prone contexts and may provide insights for other amenity-rich areas

As with any research approach there are limitations to this research that must be acknowledged. There are some limitations to purposive sampling. Initial reliance on the County Wildfire Safety Specialist for identifying key informants may have led to the inadvertent

exclusion of other individuals in the community who garner community support but who may

not be in contact with or have a favorable relationship with the CWSS. Further, the nature of

these data do not allow for estimation of the prevalence of attitudes and behavior which would

provide a basis for making generalizations. Additionally, it was difficult to recruit individuals

who do not mitigate to participate in the interviews. While participants often spoke at length

about neighbors who did not mitigate or who had "let it burn" attitudes, it was difficult to solicit

contact information for those individuals and those identified as such either they did not return

phone calls or refused to participate in this study. Thus the voices of WUI residents who outright

refuse to mitigate fire risk on their properties have not been heard through this study.

Despite these issues, the advantages of a qualitative research approach cannot be

underestimated particularly in light of increased efforts to educate and motivate homeowners to

implement mitigation measures on their private property. This approach is productive for

understanding decision-making with respect to fire risks and provides insight into the rationale

for those decisions that could not have been conceptualized before conducting the interviews.

The insights from this research are particularly important for those engaged in forest and fire

management efforts who seek the support and/or participation of homeowners living in fire-

prone communities and near fire-prone public lands. Information dissemination about fire risk

and mitigation options alone may not motivate homeowners to adopt mitigation strategies.

Understanding the social and environmental dimensions of place attachment provides

opportunities to reshape public education and outreach in order to incorporate values and

priorities of WUI residents.

Further, it is clear that fire issues need to be placed in a larger context in which decisions to

move to WUI locations often involve knowingly accepting fire as one among many other

inconveniences associated with rural life, but that are offset by benefits residents value highly.

Andy (late 30s, 2.5 year resident), sums up a sentiment shared by many:

> *I am going to leave some trees up and...if fire comes through...I am going to live for the days when I enjoy my house and my trees surrounding it and the shade versus the one-day when the forest fire comes through.*

Such considerations may contribute to social science efforts to understand why those who face

wildfire and other natural hazards do (or do not) adopt mitigation measures.   In addition, it

provides insight into the decisions of those who decide to accept natural hazard-related risks

associated with living in amenity-rich contexts.

Note:

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