Improving Wildfire Preparedness: Lessons from Communities across the U.S.

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Abstract

Communities across the U.S. have been taking action to adapt to the wildfire risk they face. In a series of case studies conducted in 15 communities, researchers identified and described four elements that form the foundation for community wildfire preparedness: landscape, government, citizens, and community.

Keywords: *community preparedness, wildfire risk, mitigating risk, fuels reduction, rural communities*

Introduction

The past quarter century has been challenging in terms of wildfire in the United States (Table 1). The National Interagency Fire Center (NIFC) maintains a list of "Historically Significant Wildfires"—fires that are significant in terms of acres burned, value of the resources destroyed, or lives or property lost dating back to 1804. Of the 62 significant fires listed by NIFC, 25 have occurred since 1990 (National Interagency Fire Center 2007). Many of these fires burned in the wildland-urban interface—the area where homes and other structures or human development intermingle with undeveloped wildland or vegetative fuels (National Wildfire Coordinating Group 1996).

> *The interface fire problem is not just the responsibility of land managers. Many other groups must share responsibility for solving the problem—fire protection agencies, homeowners, local and regional planners and governing bodies; builders, contractors, and building and landscape architects; and insurance carriers and mortgage bankers* (David 1990, 27).

Successful wildfire management involves a range of agencies, organizations, groups, and individuals at the federal, state, and local level (Jakes et al. 2004). While federal,

Table 1. Annual U.S. wildfire statistics by year (National Interagency Fire Center 2007)

	Year					
Category	2000	2001	2002	2003	2004	2005
Number of fires	122,827	84,079	88,458	85,943	77,534	66,552
Number of acres burned (1,000 acres)	8,422	3,555	6,938	4,918	6,791	8,687
Suppression costs for federal agencies (billion U.S. dollars)	1.4	0.9	1.7	1.3	0.9	0.9

state, and county managers will undertake activities to control and prevent wildfire on public land, certain wildfire management efforts—such as insuring adequate water systems, sufficiently wide streets, clear and consistent street signage, and maintenance of perimeter green belts, are best done at the community level (David 1990).

Many communities are rising to the challenge of adapting to life with wildfire. These adaptations focus on ways to increase wildfire preparedness. Communities have been aided in their efforts by programs or groups such as the Fire Learning Network, Fire Safe Councils, and Firewise Communities USA (Sturtevant and McCaffrey 2006). The Healthy Forest Restoration Act of 2003 encourages communities to work with local units of government to develop community wildfire protection plans that will improve preparedness by decreasing fuels and structural ignitability (Society of American Foresters 2004).

Pretty (2000) has discussed how the success of communities to achieve any goal, including improved community wildfire preparedness, relies on the accumulation of capital. Capital is generally described as resources that are invested to create new resources (Rule et al. 2000). When economists refer to capital they focus on money; however, capital can take many forms, and various classifications of capital have been offered (for example, Pretty 2000; Flora 2000, 2003; Rule et al. 2000). In this discussion, we illustrate how the five capitals identified by Pretty (2000) and others—natural capital, social capital, human capital, physical capital, and financial capital—can help explain the importance of elements to community wildfire preparedness.

A recent study of community wildfire preparedness in 15 communities across the U.S. focused on (1) steps taken by communities to increase their wildfire preparedness, and (2) the social conditions necessary to implement and sustain these steps (Jakes et al. 2003b; Jakes et al. 2004; Kruger et al. 2003). In this paper we present findings from a selection of these case study communities, and discuss critical elements to support community wildfire preparedness. This discussion will be informed by concepts related to the accumulation of capital.

Methods

Framework

Before studying the elements supporting community wildfire preparedness, we needed to develop an understanding of the preparedness decision-making process. The framework proposed for this process is displayed in Figure 1. Decisions to improve wildfire preparedness are made at three levels: the individual or homeowner, the organizational, and the collective levels (left side of Figure 1). When an individual makes a decision regarding wildfire preparedness he or she generally focuses on actions to create defensible or survivable space on his or her property. The assumption in this study, and illustrated in Figure 1, is that an individual acting alone cannot have a major impact on community preparedness for wildfire. Organizations, including various federal, state, and county land management agencies, city councils, non-governmental organizations, and neighborhood associations, can make decisions to take community-level action to improve wildfire preparedness. In addition, groups or individuals can come together to make collective decisions to take action as a community to improve wildfire preparedness.

Desired outcomes of improving community preparedness include increasing readiness, decreasing emergency response time, minimizing negative impacts, and facilitating restoration and recovery efforts. However there is an additional, broader potential outcome resulting from wildfire preparedness activities, in particular activities to reduce haz-

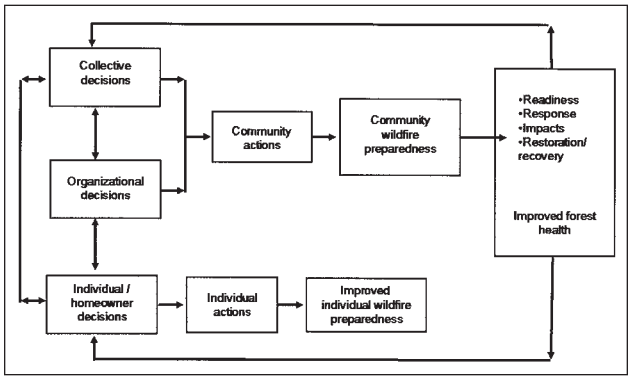

Figure 1. A Framework of Community Wildfire Preparedness

ardous fuels—improved forest health. Feedback from these outcomes cycles back into future decisions to improve wildfire preparedness.

Unit of Analysis

The unit of analysis for this study is the community. As described in the Firewise Communities workshop literature (2001, 4):

> *Communities are more than places where people live, work, and raise their children. They are the relationships, partnerships, attitudes and values that bind people, businesses, organizations and agencies together and motivate them to achieve common goals. A stable community provides a sense of security, serenity, comfort, and neighborhood.*

Wilkinson (1991) identifies three characteristics that define community: a locality, a local society, and a process of locality-oriented collective actions. The communities selected for case studies represented different political units—rural fire district, subdivision, town, watershed, county, and tribal lands/reservation—but each displayed Wilkinson's characteristics of community.

Four criteria were used to select the case study communities. First, each community experienced wildfire within five years of the study or is located in a landscape where ecological conditions are rated as a high fire risk. Although local citizens may not recognize the high fire risk in their community, the resource and/or wildfire professionals in these communities described each as having a high fire risk.

Second, all case study communities were taking steps to increase wildfire preparedness. Two types of preparedness are recognized in the natural hazards literature: physical preparedness and social preparedness (Gillespie et al. 1993). Physical preparedness emphasizes adaptation of physical amenities to minimize loss of life, injury, and property damage. For wildfire, physical preparedness includes activities such as vegetation management or improved communication systems and water access systems. Social preparedness focuses on activities such as planning, training, and implementing steps to improve financial security. Over the past few years there have been a significant number of qualitative case studies illustrating steps taken to improve physical and social preparedness for wildfire (Boura 1999; Hudson and Lang 2003; Hudson et al. 2004a, 2004b; Kruger and Sturtevant 2004b; McGee and Russell 2003; Steelman 2004; Steelman and Bell 2004; Steelman and Kunkel 2004a, 2004b; Teie and Weatherford 2000).

Third, communities in the study represent a range of social capital. Social capital, as defined by Pretty (2000, 78), is the "cohesiveness of people in their societies," and the various networks and relations that build trust and make cooperation possible. We did not focus on communities with only high levels of capital because we wanted the findings to be relevant to a range of communities.

Figure 2. Locations of Community Preparedness Case Study Communities

Finally, case studies were selected to represent three regions: the West, the Southeast, and the Midwest-Northeast, with five cases in each region. The 15 communities selected are shown in Figure 2.

Study Design

A multiple-case study design was used, with each community representing a case. The advantage of a case study is its ability to deal with contextual conditions (Yin 2003). Contextual conditions, both in the community and in the landscape, are extremely important to wildfire preparedness. As observed elsewhere, landowners and residents are the most important components of a strategy to manage wildfire (Lavin 1997), but a combination of vegetation, topography, and weather help define solutions that have the best chance for reducing the potential for disastrous wildfires (Bailey 1991). In addition, the case study method allows the researcher to begin the case without knowing the precise boundaries of the case, and to discover insights into the ways that decisions regarding wildfire preparedness are made (Yin 2003). The benefit of multiple-case studies is that they strengthen or broaden the analytical generalizations.

Case studies lend themselves to the grounded theory research method. In grounded theory, researchers use an inductive method of observing aspects of the environment—in this case community preparedness for wildfire—and search for patterns that may point to relatively universal principles (Babbie 1998; Maxwell 1998). By conducting multiple-case studies the researchers hoped to identify patterns in the community conditions that support wildfire preparedness that will lead to an understanding of the elements that form a foundation for wildfire preparedness.

Approach

Key informant interviews were conducted in each community. Patton (1980, 182) describes key informants as "people who are particularly knowledgeable and articulate, people whose insights can prove particularly useful in helping an observer understand what is happening." Within each community, researchers started with a list of people whose official duties require that they be knowledgeable about wildfire preparedness, including the chief of the fire department, county emergency services officer, sheriff, and the wildfire management staff for the forest land adjacent to the community (federal, tribal, state, industrial, and/or county lands). Researchers also talked to the city manager, mayor, or member of the city council and others for whom wildfire preparedness is not part of their jobs, yet they played an active role in wildfire preparedness activities in the community.

A general interview guide outlined a series of themes to be explored during interviews with each key informant. This served as a checklist to insure that all relevant topics were covered and that common information was obtained for all cases. Questions in the interview guide focused on eight themes: natural resource issues/concerns, wildfire preparedness (process, planning, activities), networks and interactions (collaboration, cooperation—within the community, among agencies, between agencies and the community), resources for preparedness, perceived keys to preparedness, next steps to improve preparedness, and suggestions for other communities.

Pilot tests were conducted in three communities (Bend, Oregon; Gunflint Trail, Minnesota; and Waldo, Florida) to fine-tune the framework, interview guide, and methodology (Jakes et al. 2003b). The final methodology included taping each interview and transcribing the tapes. Field notes were also recorded during each interview. More than one researcher was present in each community, and in most cases there was more than one researcher at each interview. In addition, more than one person was involved in the data analysis for each interview.

Data Analysis

Community-level data analysis was a two-step process: (1) each interview was analyzed by more than one member of the research team, with data organized by themes then (2) local researchers met to compare their findings from each interview and to arrive at a set of findings for the community that address each of the eight themes.

Case study summaries were written and published for each community.[2] Case study summaries focus on information useful to communities, including steps taken to improve community preparedness, social conditions necessary to support steps taken, next steps for each case study community, and lessons for other communities. The summaries also include a brief description of the social and ecological setting and the fire history of each community. Each case study summary was reviewed by all researchers working in that community, by at least one other researcher working in other communities, and by three or more members of the community.

Final steps in data analysis occurred at a three-day workshop with all nine members of the research team meeting to discuss findings from each case and identify cross-case patterns related to community wildfire preparedness. The foundation elements and keys to preparedness emerged at the workshop during the exploration of cross-community patterns in wildfire preparedness.

Results

Elements that form the social foundation for wildfire preparedness can best be understood by highlighting findings from several case study communities. Six of the 15 communities are discussed in some detail below. Findings from other communities will be brought in during the discussion to further describe the foundation elements.

Applegate Valley, Oregon

Fire is no stranger to the Applegate Valley (Sturtevant and Jakes 2003). In 2001, the Quartz Fire burned more than 6,000 acres, highlighting the vulnerability of the community to wildfire and creating a sense of urgency to prepare for future fire events.

Key citizen leaders played a critical role in improving Applegate Valley wildfire preparedness. An agency representative described the Applegate community as "motivated, organized, a highly unusual community." This agency representative further observed:

> *This community has leadership... the Applegate Partnership group. In a sense, it's different than a lot of places I've been with the Forest Service because it's not us going out into the community and trying to tell them what they need to do. They don't need our help. They're doing stuff on their own.*

The Applegate Fire Plan is a key outcome of community action in the Valley. It has been a truly collaborative process involving local residents and 24 federal, state, and county agencies:

> *The power of the Applegate Fire Plan and the Partnership is that everybody is invited to the table. You want everybody at the table... The Fire Plan has such broad representation; no one's going to stop it because everyone's at the table.*

The Plan is a reader-friendly primer on fire-dependent ecology, a how-to manual on hazardous fuels reduction and neighborhood emergency preparedness, and a blueprint for agency and organizational action.

The cooperating agencies have designed forest health projects that resulted in fuels reduction across adjacent public and private lands. The Bureau of Land Management (BLM) invited area residents to work directly with BLM contractors to complete fuels reduction work on federal lands adjacent to their properties, and coordinated use of the Slashbuster ® (a tractor-mounted, mechanical device that shreds woody vegetation) on public and private land. The local fire department and Oregon Department of Forestry have worked with landowners to assess and reduce their fuel loads, disbursing National Fire Plan cost-share funds to over 400 residents.

Barnes, Wisconsin

For most of the residents of the Midwest or Northeast, including Barnes in northwestern Wisconsin, wildfire preparedness is not a priority. One resident is of the opinion that when it comes to wildfire preparedness or fighting wildfires, her neighbors "expect someone else to handle it." However, the confounding factors of declining forest health, a build-up of hazardous fuels from blow-downs during windstorms, and an expanding wildland-urban interface make it easy to understand why forestry professionals have been eager to engage the community in wildfire preparedness activities (Jakes et al. 2003a). As observed by a forester in the county, "We have the potential here, but not the occurrence."

In areas where the wildfire preparedness message lacks urgency, a local government representative often takes the lead in spreading the wildfire message. Following a major blow-down in 1999, the Wisconsin Department of Natural Resources (WDNR) ranger in Barnes put together a packet of information for residents, including information on wildfire, and hung the packets on every door in the affected area. This was a time-consuming task in an area with many scattered seasonal homes. However, this teachable moment was not lost as the ranger acted quickly to spread the wildfire preparedness message. This and other actions have earned the WDNR a reputation as being proactive with regard to wildfire. People also come to the Barnes' ranger office with questions about wildfire and forest management in general. The WDNR is the only public land management agency with a physical presence in Barnes, so it is natural that it is the first place to which people turn.

There are other projects that have improved wildfire preparedness in and around Barnes. Addresses in the county have been revised for consistency. A book of emergency response maps has been updated to identify sources of water. Local businesses have played a role by providing space for flyers or brochures. The WDNR has partnerships with local volunteer fire departments and industries that own significant acreage, but for the most part public and private landowners stay within their own boundaries. This is true for the local communities as well. As one county official noted:

> *I think there is a tendency [to think that] this is our town, these are our borders. We [will] take care of ourselves. We don't think about the fact that the fire may cross the border one day.*

Bend, Oregon

Bend, in central Oregon's high desert, experienced two major fires in the 1990s—the Awbrey Hall Fire (1990) which burned 3,000 acres and 19 homes, and the Skeleton Fire (1996) which burned 17,000 acres and 21 homes (Sturtevant and Jakes 2002). The SAFECO Insurance Company covered significant losses incurred in these fires. They recognized that something could be done to reduce future losses and offered seed money to increase fire protection in the area. Bend's fire marshal suggested a public education campaign, a marketing company was hired, and FireFree was initiated.

Eighty-five percent of Deschutes County (where Bend is located) is under federal management. Representatives of these agencies, with a long history of working together as a fire cooperative, recognized the importance of coordinating efforts to reduce the risk of wildfire on both public and private lands and were therefore early participants in FireFree.

FireFree builds on many of Bend's strengths—a diverse community comprised of highly skilled residents with an environmental ethic and strong civic leadership. Bend also has a number of connected and active civic organizations. Neighborhoods and subdivisions range from mobile homes and small houses to destination resorts and gated communities. FireFree recognizes this diversity and draws on the city's existing organizational networks to bring an array of messages to the different homeowners. In addition to a multi-media information campaign, the FireFree program developed a speakers' bureau and network of neighborhood associations to carry the message and mobilize individuals for county-sponsored cleanup days during which landfills are available for free disposal of yard debris.

Gunflint Trail, Minnesota

Residents along the Gunflint Trail, a 62 mile dead-end two-lane paved road running from Lake Superior to the Boundary Waters Canoe Area Wilderness along the Minnesota-Ontario border, know the fire history of the area and understand the role of fire in their ecosystem (Jakes and Nelson 2002). As was the case with many of the communities in this

study, the Gunflint Trail community is protected by a volunteer fire department. One challenge in managing a volunteer fire department is maintaining a stable workforce. The fire chief of the Gunflint Trail Volunteer Fire Department (GTVFD) determined that an incentive he could offer his fire fighters for remaining with the department was a retirement plan. He was able to qualify his fire fighters for a state retirement fund, and enlisted the brother of a local resident to manage the GTVFD's funds at no charge.

Lakes associations organized by property owners on the many lakes along the Trail provide an important network for educating the local population, especially seasonal residents and second-home owners. They have also been active in raising funds for the GTVFD. One resident stated that the GTVFD receives more funding from lake associations than property taxes: "[It's a] game to see who can raise more money. They are ready to do it."

Landscape plays several roles in wildfire preparedness along the Trail. Local residents know their fire history, and the role of fire in the landscape. One resident said that there is a "community memory" when it comes to wildfire along the Trail, and that "people associate the north woods with big fires." The isolation of the Gunflint Trail helps reinforce the idea within the community that it needs to take control of its own destiny in many areas, including wildfire preparedness. As observed by one county official:

> *[We] live in a peninsula of a community—a peninsula that juts into the [Boundary Waters Canoe Area Wilderness]. [We are] surrounded by wilderness. We are proud to live up here... One thing to remember is there is no organized township, no government, no structure, no [formal] leadership. People have to rise up and take it upon themselves to get things done.*

Palm Coast, Florida

Palm Coast, Florida has experienced several devastating wildfires in its short history (Monroe et al. 2003a). An early court decision prevented the developers from building in phases, so lots were sold with no timetable for when construction would occur. Many lots remain un-built, owned by absentee owners from around the world, and covered with highly flammable vegetation such as young pine trees, sawpalmettos, waxmyrtle, and vines. In 1998 a fire destroyed 70 homes in Palm Coast. Community residents say that the 1998 fire and citizen anger and frustration about fire management led to a change in the elected leaders and several department heads. These new leaders took actions to increase wildfire preparedness including acquiring new equipment, wells, and communication tools for connecting other departments, other agencies, and the citizens to emergency response.

A new fire chief seized the opportunity these changes provided to push forward an ordinance that had been proposed earlier. The ordinance was the most controversial aspect of the new approach to wildfire preparedness. The ordinance directs the city to send letters to owners of lots that have been identified as having a high fire hazard. The owners can reduce fuels themselves, or ask the city to perform the service for them and pay the cost. If the lot owner does not cooperate, the city will clear the underbrush and charge the owner the cost plus a fine. If no payment is made, the city will place a lien on the property that must be paid before the lot can be sold or improved. This ordinance was the result of many years of discussion and debate. As observed by one Palm Coast resident, "*There was a concern about property rights. No one was against it, but there was resistance as they thought that their traditional civil rights were threatened*."

Tahitian Village, Texas

Tahitian Village, a subdivision of Bastrop, Texas, is located just east of the capital city of Austin. Narrow roads, steeps hills, confusing street names, and highly flammable shrub fuels make this area extremely vulnerable to wildfire. In 1984, a fire to the east of Tahitian Village burned 900 acres. No lives were lost, but six structures were destroyed. Little action was taken following the fire to improve preparedness, but that changed in 1998. The extreme drought that year and Florida's wildfire experience put people in Texas on high alert (Monroe et al. 2004). The Tahitian Village Property Owners Association and the Civic Association hosted a presentation by the Texas Forest Service (TFS) and the Bastrop Volunteer Fire Department to explain fire behavior and defensible space. They were also seeking homeowners who would allow a work crew to use their homes to create a defensible space demonstration area. The creation of the demonstration area was an empowering experience for the community and homeowners. A homeowner recalls her decision to be part of the area:

> *They said we are out here to offer to do five pilots—to come on your property and show you what to do and help you do it. So my hand shot up instantly... The [Texas] Forest Service very quickly followed-up, came out and their personnel relations were fabulous. They taught me, and they gave me information. They showed me and they demonstrated and were very positive.*

The demonstration area is just one of several projects that have been undertaken in Tahitian Village to increase

wildfire preparedness under an umbrella organization called FireCAP (Fire Citizens Advisory Panel). One city official observed about these citizen groups that "[It] is really empowering, in my judgment, for the local folks to do whatever they can see... [This is] going to build local capacity."

Another local program, The Tahitian Village Wildfire Mitigation Program, held neighborhood meetings to encourage homeowners to conduct their own hazard assessment. The assessments help homeowners identify actions they can take as individuals and as neighborhoods to mitigate wildfire risks.

The story from Tahitian Village calls attention to the importance of building community capacity through partnerships, "There is a strong bond between the TFS and volunteer fire departments. We operate as one unit. That builds local capacity... trust."

Discussion

While there were many lessons to be learned from our 15 case study communities, analysis identified four elements that were the foundation for community preparedness in all our communities: landscape, government, citizens, and community. Being aware of these elements and the roles they play can help insure that those involved in promoting community wildfire preparedness are more effective at their task.

Landscape

There are three aspects of the landscape that motivate many citizens in the case study communities to take responsibility for wildfire preparedness: vegetative conditions, location, and attachment to place. First, vegetative conditions defined each community's fire risk or hazard. There would be no need for the case study communities to engage in wildfire preparedness activities if vegetative conditions were different.

Second, the location of the community in the landscape—whether it be isolated in a valley, a "peninsula" of private land surrounded by wilderness, or an intermix with convoluted jurisdictions—can motivate people to take responsibility for wildfire preparedness in their community. As one homeowner in the Applegate Valley said:

> *It's our fault we moved out into the interface. Can't expect fire department, even though we pay taxes, to save your joint if you didn't worry about brush around your house. We have a responsibility, otherwise we're just a bunch of kept people and that doesn't make sense.*

Finally, landscape played a role in improving wildfire preparedness because community members are attached to their place. This attachment promotes a positive emotional bond between people and the place (Davenport 2003). Schneekloth and Shibley (1995, 1) describe this attachment as "placemaking," referring not only "to the relationship of people to their places [but also to] the relationships among people in places." Because of this attachment to place, local and seasonal residents were moved to take individual and collective action to improve wildfire preparedness, to be stewards of a place that holds great personal significance.

The landscape element is closely related to the concept of natural capital. These case study communities flourish, in part, because of the natural capital in the landscape—timber products, wild and scenic rivers, moderate temperatures, snow-covered peaks. The wildland-urban interface exists because of the natural capital found in these landscapes. Yet, management of the landscape has changed the ecological functions that also define natural capital, creating the hazardous fuel conditions. Natural capital, therefore, creates conditions that both enhance wildfire preparedness and make wildfire preparedness necessary.

Government

In all 15 communities it was critical for a government representative to be involved in wildfire preparedness activities. The involvement of government representatives in community preparedness means that communities have access to funds, equipment, and talents that might not otherwise available to the community. Government involvement, then, was critical to creating the financial and physical capital necessary for wildfire preparedness.

The application of financial capital to wildfire preparedness depends in part on the level of physical capital already in the community. For example, Bend's high tax base allowed the city and county to amass critical physical capital such as well-equipped fire houses and a reverse-911 communication system. This means that new preparedness dollars obtained through the SAFECO grant and National Fire Plan could be spent on activities such as planning and public education that directly help build human and social capacity. However, in other communities such as Red Lodge, Montana, new preparedness dollars were spent on urgent needs in the areas of physical capital such as new trucks—needs that took precedence over those in the areas of human or social capital (Sturtevant and Kruger 2004).

It was necessary for a government representative to take a leadership role in community wildfire preparedness in several of the case study communities. In addition, agency representatives, whose jobs include wildfire preparedness responsibilities, provide a focus for preparedness planning and implementation when local citizens need to focus on other responsibilities. For example, in Wedgefield, Florida (Agraw-

al et al. 2004), a university staff member who is a resident of the community observed:

> *I do not think the residents would have made it without the forestry service, the extension service, and County planning, and fire people. They just wouldn't have... they would have run out of steam.*

Government agencies can also work with counties and communities to develop new codes or ordinances to improve wildfire preparedness. Collaboration among the various levels of government in this activity can help insure that new local ordinances will interact with existing agency policies and regulations regarding wildfire management.

Often in natural resource-dependent communities there is tension between public land management agencies and local residents. Government involvement in wildfire preparedness gives agencies and communities something positive to work on together. In several case study communities there was evidence that trust between communities and agencies was building and strengthening as a result of community preparedness activities.

Citizens

In the case study communities, the ability of local citizens to apply their knowledge and skills to community wildfire preparedness demonstrates the value of the individual to the overall process, and empowers others within the community to become involved. The application of the community's human capacity to enhance wildfire preparedness also gives local citizens a sense that something can be done to address the issue, and that they hold that power within their own ranks.

The involvement of local citizens in community wildfire preparedness also exposes wildfire managers and community planners to knowledge different from the expert knowledge accessed in scientific inquiry:

> *Not only can [citizens] help in searching for solutions to pressing environmental problems, but they can also contribute to a kind of knowledge—in particular, local knowledge—that the professional expert requires* (Fischer 2000, xii).

There was evidence of the importance of local knowledge and skills in developing community wildfire preparedness in several of the case study communities. For example, in Waldo, Florida, a property owner manages his woodlot the way his father taught him—with fire. In 2000 a firestorm approaching Waldo was brought under control at the edge of town when it ran out of fuel on his property. Neighbors credited his use of fire to manage his woodlot with saving the town. The Florida Division of Forestry has used this example widely in their efforts to show the effectiveness of prescribed fire (Monroe et al. 2003b).

On the Colville Reservation in Washington, pine forests are thinned using mechanical treatments and prescribed burning (Kruger and Sturtevant 2004a). Because active forest management is central to the economy and culture, and burning is a traditional management tool, fire crews are skilled at not only fighting but lighting and maintaining cool, restorative fires, and residents are accepting of the associated risks and byproducts.

Agency staff, as local citizens and professionals, bring their many skills and talent to wildfire preparedness activities as well. Their skills in analyzing wildfire risk data, designing fuel reduction projects, conducting individual homeowner audits, or leading the planning process can be critical to the success of any initiative. Some have problem-solving skills that include critical reflection, openness to diverse viewpoints, and willingness to engage in frequent and productive communication. Leaders in the process were able to provide vision, direction and structure. They brought entrepreneurial attitudes and ambassadorial skills (Wondelleck and Yaffee 2000).

Community

Earlier, when discussing landscape, the responsibility that landowners felt to be stewards of the land was credited to their attachment to place. However, the success of community preparedness efforts depended on community members not only being stewards of their land, but coming together for the common good—coming together as a community. As the framework illustrates, an individual may make decisions to act in her self interest and can be a valuable sparkplug for initiating preparedness activities, but community preparedness can only be achieved through collective or group decisions.

At the local level, community was found in neighborhood associations or other landowner associations. In Berkeley Township, New Jersey, neighborhood groups provide the means to reach new residents who may not be as familiar with the fire history of the area as long-term residents (Nelson et al. 2003). Along the Gunflint Trail, the lake associations are a way to reach seasonal homeowners with fire preparedness messages. On a broader scale, collaboratives and groups at the watershed or regional levels form communities of interest to facilitate wildfire preparedness across the landscape. In Oregon, the Applegate Partnership, an established association that sought common ground and solutions for land management issues for more than a decade, works with federal agencies to secure National Fire Plan funding and provides leadership and organizational support for fire preparedness activities.

Partnerships between citizens and agencies for wildfire preparedness can introduce agency staff to important aspects

of community. For example, in the Applegate, not only did public trust in government increase as a result of preparedness partnerships, but some agency participants discovered the power of community networks and civic action. They found working at the community level to be more efficient and effective. While the Applegate Fire Plan involved more field meetings than most agency staff were accustomed to, they heard a community-level response different from what they were used to. As agencies gained a belief in communities' ability to address issues, they shared more information and power with the communities.

The 15 case study communities provide merely a glimpse of the complex nature of wildfire preparedness. This study suggests that landscape, government involvement, citizen involvement, and community capacity are key foundational elements for wildfire preparedness programs. Wildfire programs will make the greatest gains when a community builds on the elements discussed above. In addition, these elements may be a partial explanation for the different rates of success we find across communities. As wildfire programs and initiatives seek to support communities in their efforts for wildfire preparedness, it will be imperative to assess and reinforce these foundational elements.

Endnotes

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2. Available at www.nrs.fs.fed.us/4804/focus/fire/community_preparedness/cp_case_studies/.

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