Community participation in fire management planning: a case from California, USA

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Abstract

The ecological, social and economic costs of wildfires are escalating in the United States. While lightning-caused wildfires are a common phenomenon in much of the western United States, increasing population density at the wildland-urban interface has led to more anthropogenic causes of fires. Several decades of fire suppression have resulted in high fuel loads, especially in the forests. Multiple land management jurisdictions add to the complexity of developing co-ordinated approaches to fire management. The catastrophic fires in the summer of 2000 highlighted the resulting vulnerability of communities and forests very clearly.

Residents of fire-prone communities are an under-utilised resource in efforts to address complex problems in fire control and management. Local volunteer firefighters are often the first to respond to wildfires. They possess valuable knowledge of place, fire history and fuel loading. Residents also have the most to gain from participating in community-level education, co-ordination, fuel-load reduction and other fire management efforts. This paper discusses a participatory research process developed to capture and prioritise residents' recommendations for fire management as part of a county-wide community based fire planning effort in Trinity County, Northern California, USA. The process, in co-ordination with California state-level efforts to promote local "Fire Safe Councils", has enabled Trinity County to begin systematic fire management planning and implementation across jurisdictional boundaries. The experience gained may be of interest to other communities involved in landscape-scale fire management planning. The project is funded by the United States Forest Service Pacific Southwest Research Station and the California State Water Resources Control Board.

1. Introduction

In November 2000, the Trinity County Fire Safe Council in Northern California completed the first phase in an ongoing effort to collaborate with government agencies and local citizens in developing and implementing a landscape-scale fire management plan. This paper describes the process beginning with a brief introduction of wildfire and fire management concerns in the western United States. Wildfire management is discussed as a cross-boundary phenomenon that requires co-ordination among a range of actors. The limited role of private citizens in fire management to date is highlighted. The effort increases this role through the participatory research process undertaken by the Fire Safe Council in Trinity County.

2. Wildland fire in the western United States

In much of the western United States, including California, fire is a natural disturbance regime. Many ecosystems are adapted to periodic recurrence of wildfires that recycle nutrients and renew system functions. From a fire management standpoint, these fires reduce fuel loads. In the past, such wildfires were typically initiated by dry season lightning storms. Today, with growing human populations that have moved into wildland-urban interface areas, an increasing number of fires are anthropogenic, inadvertently caused for example, by discarded cigarettes or unattended campfires. Sometimes, wildfires are also caused by prescribed burns that get out of control, or by arsonists. From an ecological perspective, these fires occur at random and do not fit within a previous fire regime, to which flora and fauna have adapted. Instead, they serve to increase fire

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frequency. In addition, the economic impacts of wildfire are escalating as homes, vehicles and other assets at the wildland-urban interface are destroyed. Compounding the problem is the success of several decades of forest fire suppression policies that were intended to protect timber values and rural communities from fire. Widespread para-military scale efforts to put out every fire as quickly as possible have led to unprecedented volumes of fuel so that many forested areas are tinderboxes waiting for a spark. The mix of these factors has resulted in an increase in catastrophic wildfires of a scale and intensity beyond the range of historic variability (Biswell, 1989; Agee, 1993; Weatherspoon and Skinner, 1996).

Fire is a function of temperature, wind and fuels. Since people cannot control climate, reducing fuel loads through pre-fire treatments is the most promising method to influence wildfire behaviour (Agee *et al*., 2000). In the 11 western states of the United States, 55 percent of the land is federally owned and managed by one of several national land management agencies including the Bureau of Land Management, the United States Forest Service (USFS), the United States Fish and Wildlife Service, and the National Park Service (Loomis, 1993). One of the underlying challenges of reducing fuels is bringing together land managers – often a mix of private owners and public agencies with different mandates – and affected communities to decide which treatments to apply and where.

The scale of the fires across the United States during the summer of 2000 - captured national attention and triggered new investments and interest - in fire management. Along with continued support for fire suppression efforts, there is a significant new focus on pre-fire fuel reduction. As managers rush to implement programmes, one important source of information, expertise and ground-level support that could be drawn upon more than in the past are local communities, the people who live in the fire zone.

3. Community involvement in fire management planning across jurisdictions

In the United States, for the most part, public lands are the property of the people, managed by government agencies. Although the role of the general public in decision making for public land management has been growing since the passage of major legislation that required public comment, such as the National Environmental Policy Act (1970) and the National Forest Management Act (1976), most public land management efforts are hardly participatory or responsive to public input. Usually, federal and state-level government agencies involve the public in new forms of decision-making processes only because they are required to by law. Sometimes agency staff hope that by involving people in some steps of planning, opposition will be voiced early enough to allow for adjustments in proposed activities, and law suits filed by citizens can be avoided. The motivation in such cases is political exigency rather than recognition of the potential value of local experience, expertise and collaboration. Yet in many arenas of public land management, the people who live in the vicinities of these lands are potentially significant actors. Consider the case of wildfire management.

Local citizens are not normally involved in fire suppression planning or pre-fire decision-making processes. The suppression of large wildfires incurs enormous costs, often in the tens of millions of dollars. On public lands, firefighting agencies go into a para-military attack mode. When a fire reaches a certain size and rate of spread, or goes beyond local capacity for suppression, national strike teams are brought in from outside the area. While local line officers, e.g. USFS District Rangers, are still in charge, in effect the “superior expertise” of the strike teams takes over the “command centre” of the fire suppression activities. As rapid decisions are made regarding back-burning, bulldozing and other suppression activities, local citizens’ knowledge, expertise and opinion are not typically factored into decisions. Yet, if site-specific information known to local residents (e.g. about unstable bridges, narrow roads, locked gates and water sources on private land) were readily available, some fires might not escalate and resources could be saved. Volunteer Fire Departments (VFDs) are the first to respond in emergencies, including fire, in many rural areas. It is in the interest of public land managers to have well-trained and equipped VFDs and to maintain good communication. Local site-specific knowledge

of and experience with the terrain, past fire behaviour and locations for emergency fire lines, could save lives, time and money during emergencies.

In the event of a fire, local residents may gain lucrative short-term employment as firefighters, or work as support staff providing food and facilities for the fire base camps. However, most would prefer to forego the opportunity for such additional income and support fire managers who advocate pre-fire vegetation treatments.

The potential value of involving people in pre-fire management has been neglected. Fire is oblivious to property and jurisdictional boundaries. It is up to private landowners to carry out fuel reduction around their homes and on forest parcels neighbouring public lands. Otherwise, the risk to public resources increases. Industrial forestland owners carry out a range of fuel management and fire planning activities, sometimes, but not always, in co-ordination with neighbouring land management agencies. When a fire starts, whether on public or private land, it can quickly spread to land with different ownerships.

4. The Trinity County Fire Safe Council, California

Trinity County, California (Figure 1) is a rural county at the northern end of the state. It extends over two million mountainous acres and, with 14,000 people, has a population density of less than four people per square mile. Over 75 percent of the land is managed by the federal government, largely in the Shasta-Trinity and Six Rivers National Forests. The vegetation is predominantly mixed conifer forest and oak woodland (Sawyer and Keeler-Wolf, 1995) with fire as the dominant disturbance regime.

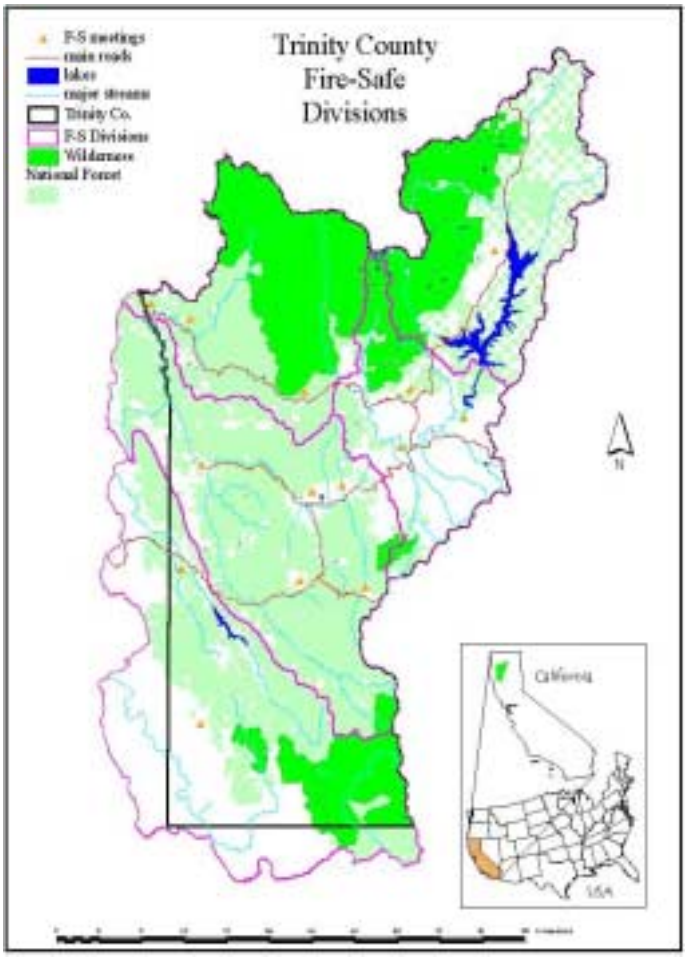

Figure 1: Map of Trinity County, California Fire Safe Divisions

(by P. Towle and K. Sheen)

During the last two decades, the impact of wildfires has increased in the area. In 1987, fires burned 91,000 acres (36,827 ha)[2] of the Trinity National Forest. The 1999 Big Bar Complex fire in Humboldt and Trinity Counties burned 125,000 acres (50,587 ha) of National Forest, Hoopa Valley Indian Reservation and private lands in 91 days. During that time air quality was so poor that the people living in the town of Hoopa had to be evacuated. Suppression costs were estimated at US$110 million (U.S. Forest Service, 2000).

In the county, fear of catastrophic fire that could repeat or be worse than these conflagrations is growing. In mid-1998, the Trinity County Board of Supervisors' Natural Resources Advisory Council appointed a sub-committee to address the issue of fire. This initiated the Trinity County Fire Safe Council (FSC) that includes representatives from local VFDs, non-governmental organizations (NGOs), the county, state and federal land and fire management agencies and others who have signed a Memorandum of Understanding (MOU) to co-operate on fire management planning (MOU, 1998).

The FSC has embarked on a landscape analysis and strategic planning process for fire management in the county. The first steps taken in 1999 and 2000 were to increase local involvement and interest in fire management planning. The objective was to capture local and regional knowledge and expertise in fire management as effectively and efficiently as possible. Participatory research and community mapping methods were adapted to achieve this goal. Two local NGOs – the Trinity County Resource Conservation District and the Watershed Research and Training Center – provided the team that led the effort, with funding from the USFS Pacific Southwest Research Station and the California State Water Resources Control Board.

5. Community mapping and participatory research

The FSC team proceeded to work with community members to:

- gather and develop a geographic information system (GIS) with available spatial data for the county that were pertinent to fire;
- identify local knowledge and spatial data relevant for emergency response;
- involve local residents and professionals to design a process for collecting community recommendations about fire management; and
- implement that process including gathering residents' perception of values at risk, collating their recommendations for pre-fire treatments to protect these values, and helping participants systematically prioritise proposed activities.

5.1. Developing the GIS

Data layers pertinent to fire management including topography, roads, hydrography, vegetation and past fire starts, were collated from sources such as the USFS, the Bureau of Land Management, and the California Department of Forestry and Fire Protection. There had been no previous effort on this scale to integrate spatial data for the county. Once the data were compiled, useful base maps for information gathering with community members and for future fire management modelling could be generated.

5.2. Identifying local knowledge and mapping emergency response data

From November 1999 on, a series of 13 widely publicised community meetings were held in VFD halls throughout the county to discuss the Fire Safe process and raise the local level of awareness about fire management issues ranging from needs of local VFDs to county, state and federal efforts. Furthermore, the FSC team wanted to identify local expertise in fire management that could be called upon later, and to gather site-specific information not found in the GIS. To ensure comparability between meetings, the basic format for all meetings was the same with two or more members of the FSC team participating in each. At every meeting, the FSC team members

[2] 2.471 acre = 1 ha

presented an overview of the Fire Safe effort and gathered participants around maps of the local terrain generated by the GIS. A computer with the GIS database was brought to each meeting so that additional information could be accessed upon request. Participants added missing information by marking reference points on the maps and explaining issues of concern, which were subsequently noted. These data, of particular interest for local emergency responses, included water sources, unsafe bridges and roads, locked gates and other similar information. After each meeting, the FSC team entered the new data into the GIS database. Maps with the new input were sent back to participants to verify that the information was accurate. Updated hard copies of the maps were left with the VFD in each participating community so that new information might be added and included in database updates regularly. The GIS was shared with local land management agencies and emergency respondents. The number of community participants in the meetings varied, but even where the turnout was low, it included a high proportion of VFD members and others with an active interest in fire management issues.

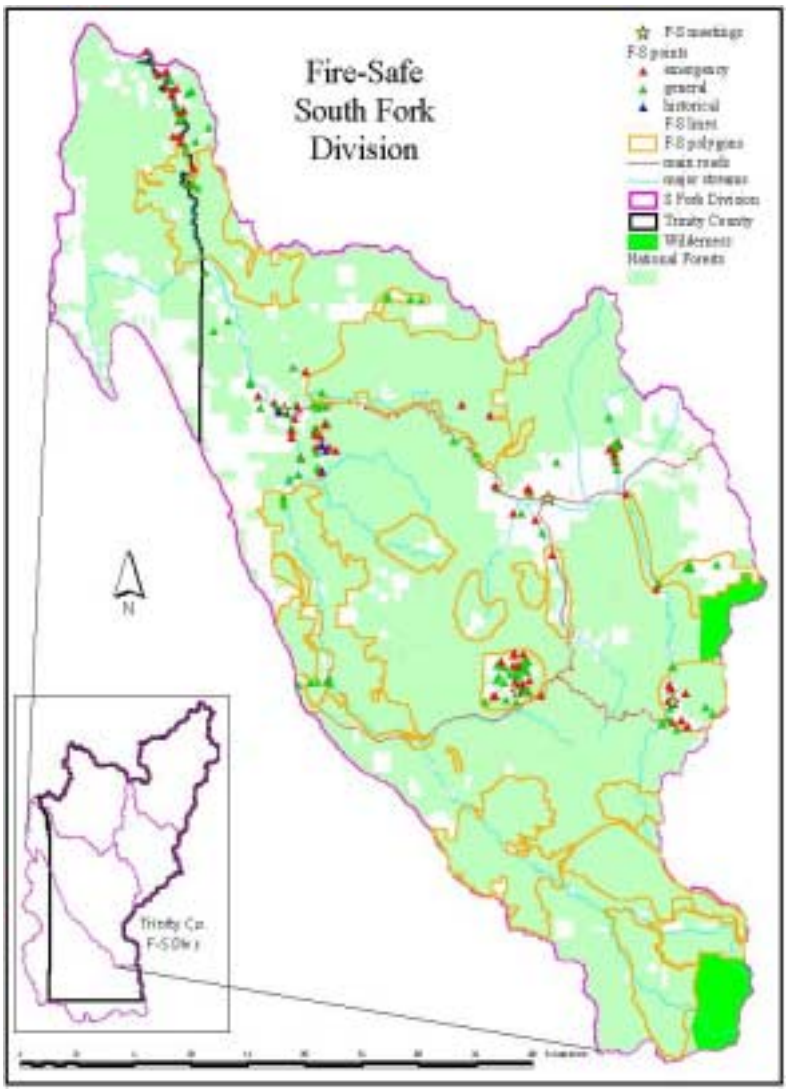

Figure 2: Emergency response data for the South Fork Division

(by P. Towle and K. Sheen)

5.3. Working with local residents and professionals to design a process for gathering community recommendations about fire management

A two-day planning meeting involving representatives of agencies and groups participating in the FSC was held in April 2000 to develop an appropriate process for gathering community input across the county. The FSC team hoped that by bringing together locally and regionally recognised experts to contribute their ideas to the process, a credible process for all concerned could be established.

At the meeting, it was decided that in addition to the GIS and local emergency response data gathered during previous meetings, the most important input from residents would be to identify and prioritise key values at risk from wildfires in the local areas, and their recommendations for protection of these values. Values at risk identified included homes, water supplies, power and communications lines, rare or endangered species habitat, and prime recreation sites.[3] Recommendations might include identifying locations for treating vegetation to reduce fire risk and hazard.

To make the best use of localised knowledge and staffing capability for meeting purposes, the county was divided into five sections. Evening and daytime meetings to maximise local attendance were held in central locations in each of these five areas, and discussion focused on the specific area in question.

Figure 3: Participants gathered around maps at the North Lake Meeting, May 16, 2000 *(photos by Carol Fall)*

5.4. Organizing community meetings to identify values at risk and to prioritise pre-fire treatments

An evening and a day-time community-mapping meeting were held in each of the five divisions of Trinity County in May 2000. Publicity to encourage broad participation was crucial. Everyone who had attended earlier community meetings or who had been identified in the April meeting received a written invitation and many people were contacted directly by phone. In addition, the meetings were publicised in the local newspaper and several press releases about the fire planning process were published.

At the meetings, people gathered around maps of their locality to discuss ideas. As in the emergency response meetings, initial input on values at risk was captured on maps and in notes taken during the meetings as well as through on-location editing of the GIS data. In each case, there were several community members, often long-term residents, who were immediately able to

[3] Note this process varies somewhat from the approach taken by California Department of Forestry and Fire Protection (CDF) in the California Fire Plan where values at risk are pre-identified and ranked by CDF staff and community meetings are held to evaluate these proposals (CFP, 1996: p 24).

contribute ideas. The FSC team typically would reconvene the following day with a smaller group of participants (often retired firemen, USFS staff or VFD members) to review and consolidate the data gathered earlier.

Once participants had identified which values were at risk from fire and where they were located, they were asked to make recommendations for landscape vegetation treatments to protect these values. Recommendations included creating 30-100 ft perimeters of defensible space around homes on private land, and thinning from below and constructing shaded fuel breaks on public lands.

Finally participants worked together to prioritise projects. In an approach adapted from similar participatory prioritisation methodologies (e.g. Margoluis and Salafsky, 1998), criteria to evaluate proposals were defined and then ranked using a matrix approach. At each meeting, several criteria to evaluate the importance or relative priority of proposed activities were presented and modified according to participants' recommendations (Table 1). Each criterion was discussed and thoroughly defined to ensure that all participants had a similar understanding of the valuation process. The resulting "scores" in the matrix were treated as indicative of relative values among proposals. To avoid a false sense of quantitative valuation, all categories were weighted equally. The resulting prioritisation matrices for each meeting were presented with a detailed description of the process applied and CD ROMs with the GIS data sets in a draft final report to the FSC in January 2001 (Trinity County Fire Safe Council, 1999).

6. Results

A number of additional recommendations emerged from the community involvement process. Federal land managers were strongly encouraged to co-ordinate across jurisdictional boundaries on fire and road management policy. Trinity County was encouraged to identify community safety zones and escape routes in case of a catastrophic fire and to keep water tenders and other equipment locally available. Strong support for VFDs was advocated. All fire managers were encouraged to take a landscape-scale view of fire hazards and to co-ordinate treatments accordingly while identifying and focusing attention on critically important habitats for wildlife and on protecting old growth forests. The agreed goal is to protect key values from catastrophic fires, reintroduce low intensity fires, and reduce fuel loads – which incidentally will provide a continuous source of employment for the county workforce (Trinity County Fire Safe Council, 1999).

7. Conclusions

The recommendations have provided a basis for Trinity County NGOs and VFDs seeking funds for carrying out more fuel reduction activities. A number of recommendations are due to be implemented in 2001 (Baldwin, 2000). Co-ordinated planning meetings between FSC members and the USFS were also held. Other FSC efforts are emerging in neighbouring counties. The report has been distributed widely and has been a topic of discussion at national fire plan development meetings. The Trinity County FSC is currently involved in developing an overall strategic plan for fire management in which community recommendations will play a significant guiding role.

Table 1: Criteria used by participants to rank recommended projects (high, medium, low)

Community - areas most highly valued by community members ♦ *High value* - community, housing development or grouping of several residences, telecommunications translator, community water supply, key travel corridors; ♦ *Low value* - no residences or infrastructure issues ♦ **Public safety** - a * was added to highlight urgent projects
Fuel hazard - areas with high fuel loads, flammable vegetation ♦ *High hazard* - dense, flammable vegetation, e.g. thickets of second growth, untreated plantations, brush fields ♦ *Low hazard* - open ground, areas previously thinned, no ladder fuel
Fire risk - areas with a high probability of fire starting ♦ *High risk* - high slope position and southwest aspect, past history of lightning strikes or high concentrations of human activity e.g. hunting camps ♦ *Low risk* - low slope position, little human activity, little past history of lightening strikes or fire
Ecological value - a measure of known ecological concerns in the landscape ♦ *High value* - known habitat of threatened, endangered species or species for which USFS survey and manage protocols apply; notable stands of old growth vegetation, known nesting habitats of rare species ♦ *Low value* do not indicate lack of ecological value but rather no outstanding concern for the particular area in question
Economic value – a measure of known economic value of area resources ♦ *High value* - areas with private property values, power lines and/or plantations or other investments/resources at risk ♦ *Low value* – no particular infrastructure or resource value
Readiness – ability of landowners and managers to respond quickly ♦ *High value* - ability of both private landowners and the USFS to act immediately with community buy in on public or private land ♦ *Low value* - significant administrative work needed (e.g environmental assessment required by the National Environmental Policy Act (NEPA)) before activities could take place
Cost of project – referred to overall economic cost of doing the work ♦ *High cost* - due to inaccessible or steep terrain or large-scale project ♦ *Low cost* - clearing defensible space around a residence, some types of controlled burn
Recreation value/viewshed ♦ *High value* - scenic highway designation; high recreational use area ♦ *Low value* – no particular value noted
Land allocation USFS land allocations were included in the matrix to give a quick view of likely treatment opportunities and constraints on public lands as defined in the Northwest Forest Plan to protect the Northern Spotted Owl (e.g. late succession reserve, adaptive management area, wilderness, matrix).

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