

# Community Participation in Fire Management Planning: The Trinity County Fire Safe Council's Fire Plan<sup>1</sup>

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## Abstract

In 1999, Trinity County CA, initiated a participatory fire management planning effort. Since that time, the Trinity County Fire Safe Council has completed critical portions of a fire safe plan and has begun to implement projects defined in the plan. Completion of a GIS based, landscape scale fuels reduction element in the plan defined by volunteer fire fighters, agency staff and community members has been a highlight of the past 3 years' work. Current efforts are focused on implementing fuels reduction projects. This paper reports on the plan development process, project implementation, and the challenges of involving landowners, particularly absentee owners, in fuels reduction activities. A demonstration effect is noted, in which a few landowners participate initially and model creation of defensible space for neighbors, who join later. The critical role of volunteer fire departments as first responders on many fire starts and the lack of funding support they face are discussed.

## Introduction

On September 2, 2001, while mop up was still underway on the Oregon Mountain Fire that had burned 14 homes on 1,680 ac in nearby Weaverville, the Hyampom Fire started just west of Hayfork, CA. The Hayfork Volunteer Fire Department and California Department of Forestry crews were quick to respond to the wildfire. They had some welcome assistance from a resident GIS expert, who brought his computer to the fire line and was quickly able to provide the crews with accurate maps of the area including terrain, roads, vegetation types and structures. The GIS database had been developed by community members working with local state and federal agency staff in a participatory fire management planning effort of the Trinity County Fire Safe Council. The Hyampom Fire was contained after coming perilously close to homes and burning 1,060 ac just outside of town. The maps provided may have helped to speed the initial attack and limit the acres burned.

In California, a growing number of communities are forming more or less formal fire safe councils. The councils share a common goal of improving fire safety, but vary in their size, structure, membership composition and activities which depend on local circumstances. Many focus on fuels reduction around private homes in the wildland urban interface, and most benefit from the sanction of the California State Fire Safe Council umbrella organization and resulting cooperation and support of state or federal agencies involved in fire management (California Fire Safe Council 2003). A few fire safe councils are forging ahead with collaborative fire management

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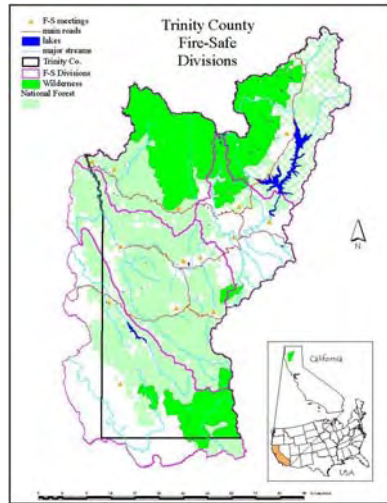
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planning efforts. This paper focuses on the planning process and plan developed by one group and on successes and challenges the group is experiencing.

## The Trinity County Fire Safe Council

Trinity County is rural, extending over 2,000,000 mountainous acres with fewer than 13,000 residents. Over 75 percent of the county is managed by the federal government, primarily in the Shasta-Trinity and Six Rivers National Forests (*fig. 1*). The vegetation is predominantly mixed conifer forest and oak woodland (Sawyer and Keeler-Wolf 1995) with fire as the dominant disturbance regime. Wildfires have burned over 100,000 ac in the county in several large fires over the last 25 yr.



**Figure 1**—Location and land ownership map of Trinity County showing partitioning in five “Fire Safe Divisions” for Trinity County Fire Safe Council fire management efforts.

In mid 1998, the Trinity County Board of Supervisors' Natural Resources Advisory Council appointed a sub-committee to address the issue of wildfire management. This committee evolved into the Trinity County Fire Safe Council (the Council) that has met on average monthly since. The Council includes representatives from local volunteer fire departments (VFD), non-governmental organizations (NGOs), the county, state and federal land and fire management agencies, and other community members. All have signed a Memorandum of Understanding to cooperate on fire management planning (TCFSC 1999) and have agreed to a mission to reduce the risk of large, high severity fires in Trinity County by establishing priorities and implementing fuel reduction on a landscape scale for improved forest health, water quality, and community well-being (TCFSC 2003). In 1999, the Trinity County Resource Conservation District (TCRCD) and Watershed Research and Training Center (WRTC), both members of the Council, were successful in gaining grant support for fire management planning and implementation from the California Department of Water Resources and the USDA Forest Service Pacific Southwest Research Station<sup>3</sup>. The funding allowed TCRCD to provide staff support for the Council and initiate the fire safe plan development process. The outside recognition further legitimized and energized the Council's efforts.

<sup>3</sup> DWR funding was for \$400,000 for 3 yr. USFS funds provided for additional GIS and planning staff support.

## **Planning by the Trinity County Fire Safe Council**

Members of the Council meet monthly to discuss current issues, funding, progress on plan development, and implementation. A planning subcommittee of TCRCD staff and volunteers has taken the lead on most plan development activities. The plan is seen as a work in progress with some high priority elements fully developed and under implementation, while others are still being discussed. Various Council members have taken the lead on different plan elements in coordination with the Council staff. The draft document is distributed in an easily updated loose-leaf binder format. The Trinity County Fire Safe Plan has nine elements (*table 1*). Along with an element focused on public outreach (Element 5) the first two plan elements have received the most attention to date and will be discussed here.

**Table 1**—*Trinity County Fire Safe Plan Elements.*

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<p><b>1. Landscape scale management and fuel reduction plan</b></p> <p><i>Participatory GIS based mapping of local knowledge pertinent to emergency response, values at risk in the landscape, identification and prioritization of fuels reduction treatments that could protect these values and identification of landscape level fuel management zones.</i></p> <p><b>2. Supporting local fire suppression forces</b></p> <p><i>VFD needs assessment and prioritization</i></p> <p><b>3. Coordinating among all Actors</b></p> <p><i>Identification of explicit mechanisms for enhanced communication and coordination.</i></p> <p><b>4. Building local pre-fire treatment and fire suppression capacity</b></p> <p><i>Identification of employment opportunities and mechanisms for local workforce capacity building in fire management</i></p> <p><b>5. Promoting public education and involvement</b></p> <p><i>Outreach to the community through schools, public events and media presentations on fire protection and management and TCFSC activities.</i></p> <p><b>6. Funding fire management activities</b></p> <p><i>Collaborative efforts to support member and joint council grant proposals, share expertise and equipment.</i></p> <p><b>7. Identifying regulatory conflicts</b></p> <p><i>Cooperation with regulatory authorities to test alternative approaches that can reduce or eliminate barriers to project implementation.</i></p> <p><b>8. Cooperating with Trinity County planning department</b></p> <p><i>Working with county planning department staff on the revision of the safety element of the County General Plan.</i></p> <p><b>9. Monitoring plan implementation and effectiveness</b></p> <p><i>Development of monitoring protocols for the review and maintenance of projects and development of organizational and community capacity through FSC activities.</i></p>	<hr/>
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### **Element 1: The Landscape Scale Fire Management and Fuel Reduction Plan.**

Development of this element of the Fire Safe Plan depended upon existing GIS capacity and previous work that had been done by the not-for-profit TCRCD and the WRTC's Trinity Community GIS to compile and make compatible GIS data layers for Trinity County from a range of state and federal sources. Using these base layers, the Council planning team applied a participatory mapping approach to gather

community input. The importance of knowledge of place and community based mapping (Aberley 1993) and the potential for enhancement of emergency response through local community mapping using GIS have been noted (McRae and Walker 2001). Participatory mapping, in which community members jointly define, what will be mapped, and how the data will be used, has been applied in a wide range of community development processes (Obermeyer 1998, Sieber 1997, Talen 2000) and has the benefits of engaging and empowering participating community members, making explicit information that might not otherwise be accessible.

Development of the landscape scale fire management and fuel reduction plan proceeded in three phases from fall 1999 to spring 2002. The first phase focused on gathering data pertinent for emergency response. The second phase identified and ranked values at risk from fire and made recommendations for protecting these values. The third phase involved defining preferences for placement of strategic fuel management zones in the landscape. In each case, meetings were held in local fire halls and community centers in five geographically dispersed sub-units of the county. Many meetings were held in the evening or on weekends and were publicized through locally effective mechanisms. At each meeting the Council's planning team introduced the fire management planning effort, explained the task for the day, and requested participants' assistance.

### **Phase I: Capturing Local Knowledge for Emergency Response**

There were two goals for the initial round of 13 community meetings in winter 1999/2000. The first was to map information held by local residents that was pertinent to emergency response. The second was to make community members aware of the Council's efforts and identify individuals who might be interested in participating further. The Council's planning team arrived at each meeting with large sized paper maps of the local topography, surface hydrology, roads and structures. Participants gathered around the map depicting the area they were most familiar with and, working with a member of the planning team, used pens to correct or add information to the existing maps. Potential water sources on private land, locked gates, locations where a helicopter might land, where a bridge was too weak to carry a fire truck, where a road was washed out or too narrow to allow emergency vehicles to turn around, and similar information were noted (Everett and others 2000). Data accuracy was enhanced by local experts working together in groups.

The planning team took notes during the meeting, later entered the changes into the GIS, and sent print-outs of the new maps and notes back to all participants for review. Many new data points, information to that point not available to emergency responders, were mapped. Over 100 community members participated in these meetings. In each case at least one or two very knowledgeable people were identified who could be called upon to provide assistance to the Council in the future. Often the experts were people who drove the back roads as part of their jobs and encountered issues of concern on a daily basis. As a further result of the meetings, community members in far-flung corners of the county became aware of the Council and of county efforts to support VFDs and work on fire management collaboratively. A one day planning meeting was held with Council members, agency staff and interested community members to plan the next steps. At this meeting, five geographically distinct divisions of the county were recognized (*fig. 1*). Each unit was large enough to be a recognizable unit of the county while small enough to be considered familiar territory to local residents.

## Phase II: Identifying and Prioritizing Values at Risk

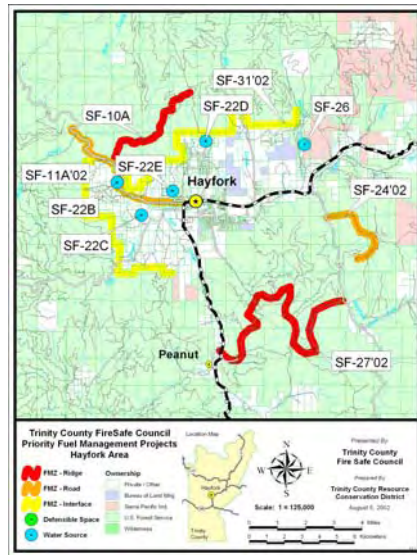
In a second round of five one to two-day workshops in spring 2000, the Council planning team met with community members identified in the previous mapping effort, agency staff, VFD members and other interested residents to identify values at risk from fire. Again, the team brought maps of each county division and, in addition, a laptop computer and projection system for live, interactive mapping in which people could see modifications being made in the GIS based on their ideas. Working systematically across maps of their sub-unit of the county, participants identified, discussed and ultimately ranked the relative importance of subdivisions, resorts, prime campsites, pockets of old growth forest, communications towers and relay stations, road corridors, and other assets that could be at risk from wildfire. They also discussed a range of fuels reduction and potential fire suppression options and recommended specific treatments to protect each of the key assets identified. These ranged from encouraging private homeowner maintenance of defensible space to defining placement of proposed shaded fuel-breaks along roads. These meetings resulted in the identification of over 100 community defined and prioritized fuel treatment projects across the Trinity County landscape (Everett and others 2000).

## Phase III: Landscape Level Fuel Management Zones

Fuel reduction projects surrounding specific assets at risk are one approach to saving key community assets from fire, once a fire reaches that location. However, they are not designed to manage the fire at a larger, landscape level. Council fire fighters and agency staff suggested that to better protect communities in case of wildfires, additional fuel reduction projects at strategic locations in the landscape might assist fire fighters in slowing or possibly stopping a fire. The National Fire Plan also calls for such fuel management zones (FMZs).

In a third round of participatory mapping meetings with community members and local agency staff, held in spring, 2002, locations for a number of strategic FMZs were recommended on key ridgelines or road corridors in each of the five county sub-units. The critical criteria for FMZ recommendation were that ridgelines 1) lie within 1.5 mi of communities; 2) are located between the community and the primary or secondary wind direction; 3) are accessible with pre-existing roads or jeep trails linked to pre-existing mid-slope roads; 4) lie in areas with a history of past fire occurrence; and 5) would have reasonable FMZ construction and maintenance costs.

To summarize, the landscape fire management and fuel reduction plan includes a three-part GIS database for emergency response, fuels reduction proposals to directly protect assets at risk, and recommendations for strategically-placed FMZs to alter fire behavior at the landscape scale. The management and fuel reduction plan for the area surrounding the community of Hayfork is shown below (*fig. 2*). The second element of the Trinity County Fire Management Plan calls for supporting local VFDs. It is important to note the pattern of fire starts in Trinity County (*fig. 3*). Of the over 9,000 fire starts recorded for Trinity County between 1911 and 2001, 4,939 fires were started by lightning. During late summer, many spot fires may be ignited on ridge tops in a single storm. From May or June through September each year, the US Forest Service retains crews of firefighters to control such fires. Of the rest of the recorded fires, 4,097 were caused by people and were concentrated in communities, along roads, and at campgrounds. As in many rural areas, the VFDs are first responders in emergencies including the majority of these fires (Cox 2002). In 2001, Trinity County VFDs responded to 1,700 medical emergencies, 225 fires and



**Figure 2**—Hayfork Area Priority Fuel Management Projects include fuel reduction for defensible space inside specific subdivisions (assets). Strategically located fuel management zones on ridges and along roads surrounding the town slow fire at the landscape level. Plan Element 2: Support for Local Fire Suppression Forces.

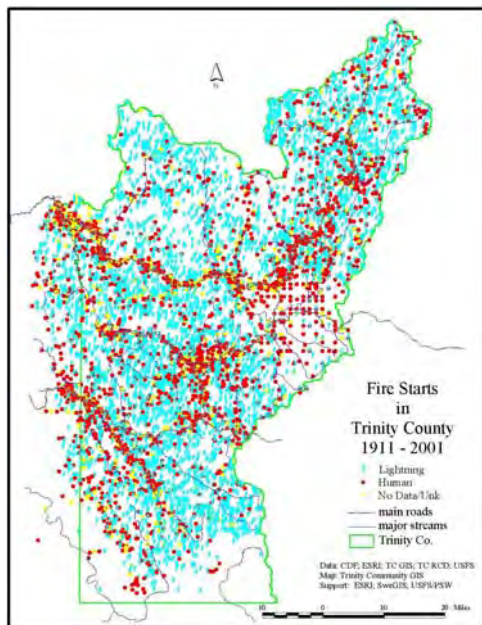
600 general requests for public assistance (Cox 2002). The Council carried out a needs assessment among the Trinity County VFDs. It showed that in Trinity County, with 75 percent of the land in National Forest, only 4 of 16 VFDs receive consistent tax-based funding. Many of the VFDs support their activities with local fundraisers. Most of the fire engines are over 20 yr old, and several are 30 to 40 yr old and costly to repair. The regulation Nomex suits, boots and other equipment are expensive. A set of self-contained breathing apparatus (SCBA) and oxygen tanks, which is required for each fire fighter, costs around \$2,500.

In this rural landscape, a fire started in a settlement of a few houses on private land or along a county road quickly spreads into the public wildland, and a wildland fire whether started at a primitive campsite or on a ridge top can quickly engulf both public and private assets in its wake. The failure to provide more support for VFDs in such landscapes is an important gap in fire suppression services. While more grants are becoming available through the National Fire Plan and state resources, it is often difficult for small VFDs to tap resources that require grant writing skills and ability to meet deadlines. The Council has become a strong advocate for the VFDs, and the Trinity County Fire Safe Plan calls for supporting the volunteers' fundraising efforts through communications about funding opportunities and grant writing.

### ***Successes and Challenges of the Fire Planning Process***

A critical measure of the success of the Council, its fire safe plan, and its collaborative development process is the degree to which proposals made in the plan are being accepted and implemented. There has been little or no controversy about the Council to date. None of the fuel reduction projects that have been carried forward for implementation have been challenged. Most of these have been on private land, but several have been highly visible shaded fuel breaks along county roads and on National Forest. It is possible that there will be increased scrutiny of efforts to implement the recommended FMZs on National Forest land. Of course any

such activities will require full compliance with the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA) and all pertinent regulations.



**Figure 3**—Fire start locations in Trinity County 1911-2001. Blue bolts indicate lightning fires, red dots indicate human caused fire. Note red dot concentration along roads and in settlements.

A number of projects were underway even as the finishing touches were being put to the final draft of the plan. Seventeen projects identified in the planning process were funded through Council-endorsed solicitation of grants from 2000 to 2002. The projects brought \$783,256 into the county for fuels management, public education and outreach, and equipment, and projects were implemented by the TCRCDD, Watershed Research and Training Center and several volunteer fire departments (TCRCDD 2002).

Beside the fuels reduction projects undertaken on public lands, such as a shaded fuel break on land managed by the Bureau of Land Management along Hwy 299, over 1,000 private landowners were contacted and invited to participate in creating defensible space around structures or on boundaries of their land. Of the landowners contacted, 185 (16.5 percent) participated in fuel reduction activities by 2002 (TCRCDD 2002). The comparatively low initial response rate is not surprising. Getting landowners involved in fuels reduction efforts is a major challenge for fire safe councils. An important demonstration effect operates, in which a few initial landowners take advantage of the support for fuels reduction work offered through the local fire safe council and provide an example that their neighbors may follow in later years. Staff working on the Council's projects reported progressive involvement of landowners who were initially cautious or even hostile (Baldwin 2002). In Trinity County, many absentee owners are difficult to reach and get involved.

While fewer than 300 ac were treated by 2002, it is important to remember that these acres were strategically placed in and close to communities and may help protect key assets or gateways to far larger areas. The task of finding funds to implement proposed projects is an ongoing challenge, particularly for VFDs. The Council has initiated efforts to support VFDs with joint proposal development and

grant writing. One important project that was funded by the Trinity County Resource Advisory Council was to have VFD members canvass homes in their response areas to discuss defensible space measures on an individual basis with their neighbors. Council members believe that landowners are more likely to welcome visits from familiar VFD members than from representatives of state or federal agencies in this regard. Numerous other public education efforts have been undertaken in conjunction with Council activities (TCRCD 2002). Gaining the attention and involvement of absentee landowners, who may only be present for short periods during the year, is a persistent challenge. One approach the Council has taken is to approach absentee owners at their annual homeowners' events, (e.g., around the July 4<sup>th</sup> weekend, when a larger proportion of landowners are present).

### **Next Steps**

As the key elements of the plan are completed, the process of plan implementation, monitoring and renewal will keep the Council busy. The emergency response data will need to be updated periodically and systematically, which could include reviews of the database every year or two with local experts and other interested participants. The data will need to be revised and redistributed to emergency responders and other users. Emergency responders such as VFDs need to be trained to use not only paper map books developed from the data sets, but also direct GIS based dispatching. More detailed emergency response databases that might include, for example, storage locations of hazardous materials for each response area could be developed.

Perceptions of values at risk in the landscape will change over time and need to be revisited. Fuels treatment projects that have been implemented will need to be monitored and maintained on a regular basis. Participating landowners will need to be reminded of maintenance needs and supported in implementation, even as newly participating landowners are encouraged to create defensible space. There will likely be wildfires that test the effectiveness of current fuel reduction efforts and FMZs and indicate ways to improve future efforts to protect community values at risk from wildfire.

### **Conclusion**

It is clear that the Trinity Fire Safe Council has achieved some success with its fire management planning process. Certainly, it has captured some of the early state and federal funding made available for community fire planning and fuel reduction projects. A number of projects that could make a difference on the ground have been implemented. Some local residents were employed to do the work. The Council has also compiled data that could be critical in emergencies and that can be used in a range of management applications. Yet the true value of such efforts is difficult to quantify and may only become clear in the event of the big fire everyone would like to avoid. Even less tangible is the value of the participatory structure of the Trinity County Fire Safe Council and its community grounded efforts to tap into and share local knowledge, expertise, and energy, although clearly community capacity is being strengthened through the relationships developed among its members and with the community at large. Perhaps the clearest measure of the promise of this fire safe council and its vision lies in the members' continuing commitment to the effort that has brought them together once a month for 4 years.

## Acknowledgments

The Trinity County Fire Safe Council (TCFSC) work was funded by the USDA Forest Service Pacific Southwest Research Station and California State Water Resources Control Board's Delta Tributary Watershed Program (Proposition 204). Activities were carried out by the TCFSC, Trinity County residents and experts on fire in California. In particular, Kenneth Baldwin, Noreen Doyas, Patrick Frost and Kelly Sheen of Trinity County Resource Conservation District and Phil Towle of Trinity Community GIS-Watershed Research and Training Center, Hayfork provided critical leadership for the planning process.

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