

# Community Fireguard: creating partnerships with the community to minimise the impact of bushfire

Community Fireguard recognises that on days of extreme wildfire danger suppression capabilities are limited and Country Fire Authority (CFA) cannot guarantee protection to each property.

On such occasions the key to community safety is the preparedness and response of the residents threatened. By promoting the development of wildfire survival strategies by communities at greatest risk, Community Fireguard promises to significantly reduce the vulnerability of these residents. Enabling residents to accept responsibility for their own safety, means that CFA is not only reducing wildfire threat, but also transferring risk to those best able to manage it—the residents.

The principles of empowerment on which Community Fireguard is based are described, and the efficacy of the program in reducing losses in recent wildfires is discussed.

The findings reinforce that reliance solely on suppression to ensure the safety of communities threatened by wildfire is an ineffective strategy. The greatest potential for increasing safety is for fire agencies to enhance community self reliance, through long term public education supported by fire protection works that assist residents defend themselves.

## Wildfires in Victoria

Protection of life and property are the fundamental goals of firefighting and

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counter-disaster operations. Yet, the protection of life and property in high intensity wildfire is problematic, and in Victoria significant losses continue to occur several times a decade (see Figure 1).

Australian wildfires are usually described by their intensity, that is the amount of heat energy produced by each metre of active fire front. Suppression effectiveness has been shown to be linked to fire intensity, with direct attack becoming ineffective in forest at less than 4,000 kW m<sup>-1</sup> (Luke and McArthur, 1978) and in grassland at approximately 10,000 kW m<sup>-1</sup> (Packham, *pers. comm.*).

Occasionally there come about combinations of weather, fuel, topography and an ignition source which produce wildfires of an intensity many times greater than can be suppressed. Fire intensity during the 1997 Dandenongs fires exceeded 30,000 kW m<sup>-1</sup> (CFA & NRE, 1997), whilst on Ash Wednesday fire intensity peaked at more than 100,000 kW m<sup>-1</sup> (Packham, 1992).

When such fires occur in the urban-forest interface they have the potential to grow to a large size and involve thousands of properties. In this event, fire fighting agencies are stretched to the limit, and it is impossible to provide individual protection to each property. On Ash Wednesday, for example, the CFA was able to commit approximately 450 tankers to the six major interface fires, whilst over 1900 homes were destroyed and thousands more directly threatened. Approximately 85% of economic damage attributable to wildfire in Victoria results from just 0.1% of all fires over a hectare in size (Loane and Gould, 1986). That is from those rare fires whose size and intensity overwhelm suppression capabilities.

Clearly most residents are going to have to face these disaster fires alone. It is going to be their preparation, and their decisions on the day which will determine whether they and their homes survive.

## Strategies for protecting life and property in extreme wildfire

The good news is that wildfires are survivable, and research into how houses burn down and why people die, has demonstrated that there is much the community can do to improve their safety and minimise their losses.

The most common cause of house loss is fires started by burning embers landing on or near the building (Lazarus and Elley, 1984; Wilson, 1984; Wilson and Ferguson, 1984; Ramsay *et al.*, 1987; Ramsay *et al.*, 1995). A house will generally survive the passage of the fire front if fire intensity in the immediate vicinity is reduced by managing the fine fuels. However, many houses burn down in the hours afterwards if there is no one present to extinguish ember caused fires.

The pattern of deaths in wildfires in south-eastern Australia clearly indicates that the greatest danger is being caught in the open or in a vehicle as the fire front passes (Packham, 1995; Krusel and Petris, 1992). Thus evacuation immediately before the fire arrives is an extremely hazardous activity. Whilst early evacuation is the option with lowest risk, the inability to

Year	Fire(s)	Fatalities	House losses
1962	Dandenongs	14	454
1965	Longwood	12	53
1969	Lara	23	230
1977	Western Districts	5	123
1983	Ash Wednesday	47	2090
1985	Maryborough	6	102
1990	Strathbogies	1	17
1995	Berringa-Enfield	–	9
1997	Dandenongs	3	40
1998	Spring Hill	–	11

Figure 1: Wildfires in Victoria 1962–1998 with significant losses.

provide the threatened community with warnings, the logistics and time required for emergency services to conduct a community wide evacuation, and the tendency of self-evacuees to wait until the fire is obviously and immediately threatening them, means that evacuation is unlikely to happen early enough to be considered preferable to resident's staying with their homes.

Popular perception, however, seems to be that evacuation is the 'safe' option (Boura *et al.*, 1995; Murray, 1986). Media coverage tends to concentrate on the dramatic stories of householders' who have left their properties only when they perceived the fire as being very close, and portrays this to the community as the only possible, and hence correct, response (Silberbauer, 1997). In fact able-bodied people who are well prepared and take shelter in their homes not only have a good chance of surviving a wildfire, but are likely to be able to extinguish any small fires after the fire front has passed, thereby saving their homes. Also, unless people choose to leave well in advance of the arrival of a wildfire, sheltering in a house will generally be safer than evacuation. A decision to use the declaration of a Total Fire Ban Day as a warning to leave the fire threat area at 10.00 a.m. prior to any fire starting, requires just as much commitment to wildfire safety as deciding to stay and defend the property.

### Residents need to develop survival strategies that suit them

In Victoria the right of each resident to decide for themselves whether they will stay and defend their property is enshrined in legislation (*Country Fire Authority Act, 1958; Emergency Management Act, 1986*). Every resident who is faced with a wildfire will have to make a decision as to how they are going to respond to that wildfire. A role of CFA public education programs is to motivate residents to make that decision well before the fire season, and then help them develop a family survival strategy which reflects their needs and capabilities.

Yet clearly many residents of high risk areas are not developing the strategies which would enable them and their assets to survive the next major wildfire.

Traditionally, CFA has used television, radio and brochures to inform the general community of the most appropriate bushfire survival strategies. The shortcomings of this media approach have long been recognised and major fire reports since Ash Wednesday have questioned the effectiveness of public education strategies in changing people's behaviour (Boura *et al.*, 1995; House of Representatives Standing

Committee on Environment and Conservation, 1984; Miller *et al.*, 1983; Wilmoth, 1992). The literature on risk perception and adult education suggest that passive publicity is not the most effective way to achieve significant changes in attitude, perception and behaviour (Rangan, *et al.*, 1996; Silberbauer, 1990; Simms and Baumann, 1983).

The traditional Information-Action model i.e. information leads to awareness and awareness leads to action, assumes that the links between receiving information and taking action are strong and direct. It assumes that the community is an homogeneous group with the same needs and values (Beckingsale, 1994). The communication is also short-term and one-way with fire services unable to correct any misunderstandings.

If asked why residents are not undertaking fire prevention work, many fire service personnel would probably reply that the community are apathetic, or that there are too many 'greenies', they might even criticise those who live on heavily vegetated blocks as being 'stupid'.

Our experience is that most members of a fire-prone community want to improve their safety, and where residents are not doing what we think they should there are usually good reasons for it. Three of these could be that:

- residents do not believe that they are personally at risk
- the advice or direction residents are being given conflicts with their values in life e.g. people with a strong conservation ethic being told that they must clear their properties
- the fire safety message is not reaching residents in an effective manner (Rhodes and Boura, 1996), and they do not understand the message or do not have the ability to apply it.

Community Fireguard attempts to overcome these obstacles. It explains to people why they are at risk—the realities of fire behaviour in their area, the limitations of the fire service in halting the fire or protecting every home, and the difficulties of evacuation. It demonstrates that there is much they can do to reduce their vulnerability without destroying their lifestyle, and helps them develop and implement survival plans that fit their values and priorities.

### How Community Fireguard works

Community Fireguard is based firmly on theories of adult education, participation and empowerment. It involves small groups of people living in high-fire risk areas, taking responsibility for their own fire

safety and working together to devise survival strategies that suit their particular situation. It is very much a 'bottom up' process of CFA assisting people to develop their own strategies rather than a 'top down' approach of telling them what to do.

The vast majority of Community Fireguard groups are self-initiated. Often one or two residents concerned about their level of safety or about a local issue such as Council or public land, poor access or water supplies, will initiate formation of a group. Others are a direct result of public meetings held by the local Brigade, CFA's Bushfire Blitz street corner meeting program, or publicity in local media. Others still are existing groups such as Land Care or Conservation groups who adopt Community Fireguard as part of their activities.

High profile wildfires in Sydney in 1994 and the Dandenong Ranges in 1997 prompted surges in group formation. Program growth in its five years of operation is shown in *Figure 2*, from humble beginnings with 2 part-time staff to nearly 400 active groups serviced by nine area-based paid facilitators, a dozen or more volunteers and staff working within their brigade areas, and a part-time program support officer.

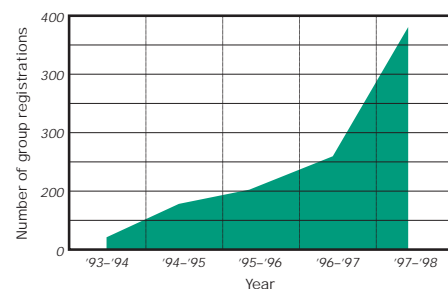


Figure 2: Growth in the number of Community Fireguard groups 1993-1998.

Once formed, Community Fireguard groups tend to go through an intense period of information collection followed by the formulation and enactment of survival strategies. A trained facilitator helps the group learn, and then acts as a sounding board as plans are developed.

The groups meet in members' homes in a friendly and informal atmosphere. A small group in a neighbour's lounge provides a more effective learning environment than a larger gathering in a cold uncomfortable public hall. The optimum learning environment is one where people feel comfortable to ask questions, safe to explore different ideas, and where their participation is valued (Beckingsale, 1994).

Group dynamics are important in this learning environment, and are also critical in sharing knowledge and developing strategies. The processes used in Commu-

ity Fireguard to facilitate group discussion recognise the indigenous knowledge within the group. The facilitator and Brigade representative are not the 'font of all knowledge'.

Belonging to a group has numerous benefits. A group can provide motivation and enthusiasm, it can provide several, or better, solutions to a problem. It can be a powerful lobby for presenting a local view to the authorities as a community group approach is more likely to be responded to, than an individual approach. Neighbourhood groups also provide community development and the social benefits derived make it more likely that residents will choose to be involved for a period of time, thus increasing the likelihood of creating a culture of safety in that locality.

The only bushfire safety strategies that people will understand, trust and actually implement during a major fire are those they develop themselves. Consequently Community Fireguard recognises the importance of empowering people to develop their own bushfire safety strategies.

Empowerment requires people to realise that they are responsible for their own safety, and accept that they themselves can do what is necessary to successfully manage the threat of fire. They need to overcome the learned helplessness promoted by inaccurate and sensationalised media reporting of wildfires. They also need to have the knowledge and skills to develop their own strategies, and they need the technical and resource support to enable them to implement those strategies. The Community Fireguard process does not end with the provision of information but rather recognises the need to work with the community over time to achieve long term behaviour change (see *Figure 3*).

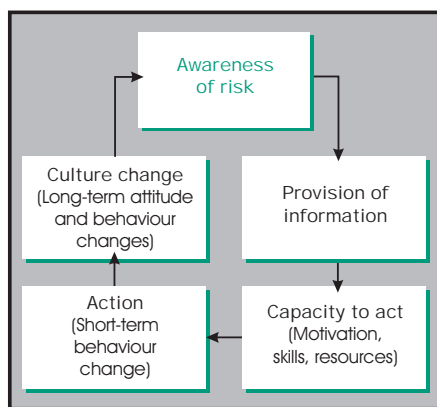


Figure 3: The community education cycle (after McWaters, pers. com.).

### What can Community Fireguard groups do?

Community Fireguard recognises the complex nature of the bushfire threat, and

that for a community to reduce their vulnerability to fire they must take a holistic approach.

To develop an effective survival strategy a family needs to:

- know what they can expect from the fire and emergency services during a major fire, understand the law regarding evacuation and road blocks, and appreciate the unreliability of reticulated water, power, and telephones
- be prepared for what a major fire looks, sounds, and feels like
- understand how houses are ignited, what can be done to improve their safety by reducing fire intensity and reducing avenues for embers attack, and the importance of active defence by residents in reducing house loss
- make the decision to stay or evacuate considering the safety level of their home, how much warning they would get, how far they would have to travel to safety and what sort of roads they would have to use
- consider the capabilities of the family members who will be home. Does there need to be a different plan for week days when only mum and two young children are home, as opposed to the weekend when the whole family is there? What will the rest of the street be doing?

Working as a Community Fireguard group increases the options available to residents:

- complementary fuel management and the organisation of working bees to help those less able to manage their property
- the development of telephone trees to facilitate the spread of emergency information through the group
- selection of 'safer homes' in which people can shelter whilst the fire front passes
- identification of more vulnerable members of the community who need additional assistance e.g. the old, infirm, or even someone without a car at home or a shift worker asleep during the afternoon
- a knowledge of what neighbours will do during the fire, and the opportunity to support each other morally and physically during the fire.

Once plans have been finalised many groups become less active as there is little reason for them to continue to meet, however the community networks developed during the education and planning stages remain and this mutual support can prove vital during wildfire. It has been encouraging that groups which formed during one summer have chosen to meet again prior to the next fire season. Groups are also kept in touch via a quarterly

newsletter, which contains many articles provided by program participants themselves.

### An interface with the community throughout the emergency management process

Community Fireguard is not just an education program. Rather it provides a framework for emergency services to interact with high risk communities throughout the emergency management process—prevention, preparation, response and recovery. In this way Community Fireguard is fundamentally different from other 'education' programs, which are limited to provision of prevention or preparedness messages.

Community Fireguard groups are in a unique position to interact with emergency managers during a wildfire. Not only does the education phase give them the knowledge necessary to appreciate the issues of emergency management, but their history of working with local CFA brigades and staff, and personnel from local government and public authorities to solve fire safety issues has built up confidence and trust.

This relationship is an important prerequisite to an effective warning system—something that has proved extremely difficult to provide for wildfire (Boura *et al.*, 1995; CFA and NRE, 1997; Miller *et al.*, 1984; Petris, 1995; Senate Standing Committee on Industry, Science, Technology, Transport, Communications and Infrastructure, 1994).

For an emergency information, or warning, system to be effective several requirements must be met:

- the community must understand the system, know how to access it, and believe the information it provides
- appropriate information must be collected and analysed by the fire agency within a very short time frame e.g. 10 minutes
- timely and accurate information must be actively disseminated to the threatened community through a variety of channels
- the threatened community needs to possess the knowledge necessary to react appropriately to the information they receive.

Thus an effective warning system needs to be developed with the community, and requires an ongoing public education component as well as a strong commitment from the Incident Management Team and wider emergency management network.

In time emergency managers will come to see programs such as Community Fireguard as an integral part of managing

a wildfire emergency, rather than as a 'touchy feely' education program. *Figure 4* is a compilation of the interaction between Community Fireguard groups and CFA during recent wildfires.

### Evaluation research

In 1996 the Department of Psychology at Melbourne University commenced a longitudinal study on the effectiveness of the Community Fireguard program. Preliminary results from this study show that:

- there is a high level of knowledge regarding basic wildfire safety actions both within Community Fireguard groups and in the wider community
- in terms of the absolute levels of awareness, reading of information materials, knowledge and actions, Community Fireguard members rate higher than non-members
- in particular, in terms of taking action Community Fireguard members rate well.

- while Community Fireguard members rate similarly compared to non-members with respect to preparing house and property, Community Fireguard members rate significantly higher for more sophisticated strategies; in terms of planning (including family, clothing, animals), discussion of plans with family, joint planning with neighbours, taking care of the vulnerable in their community, setting up warning systems within the community, and deciding on evacuation (Rohrmann, 1998).

The study showed that Community Fireguard is very well received by the community. Evaluation of group activities, information provided, and of staff involved in delivering the program was overwhelmingly favourable. Community members rated as very positive the increase in their understanding of bushfire issues, their increased ability to support and help each other, and the organisation of Community Fireguard meetings. CFA staff involved in

the program were rated very highly by the community with respect to facilitators' technical knowledge, ability to guide groups, ability to activate and inspire group members, approachability and availability, and ability to address specific community needs (Rohrmann, 1998).

While this research project was unable to measure the full impact of Community Fireguard, Rohrmann argues that evidence from this research project clearly indicates that the community-based Community Fireguard approach is beneficial on the whole to the bushfire preparedness and improves both individual and group risk mitigation (Rohrmann 1998).

The results indicate that Community Fireguard is successful in its aim to not just raise awareness but to achieve behaviour change. Members are not only informed, but actually put in place individual and community strategies that enhance their bushfire preparedness.

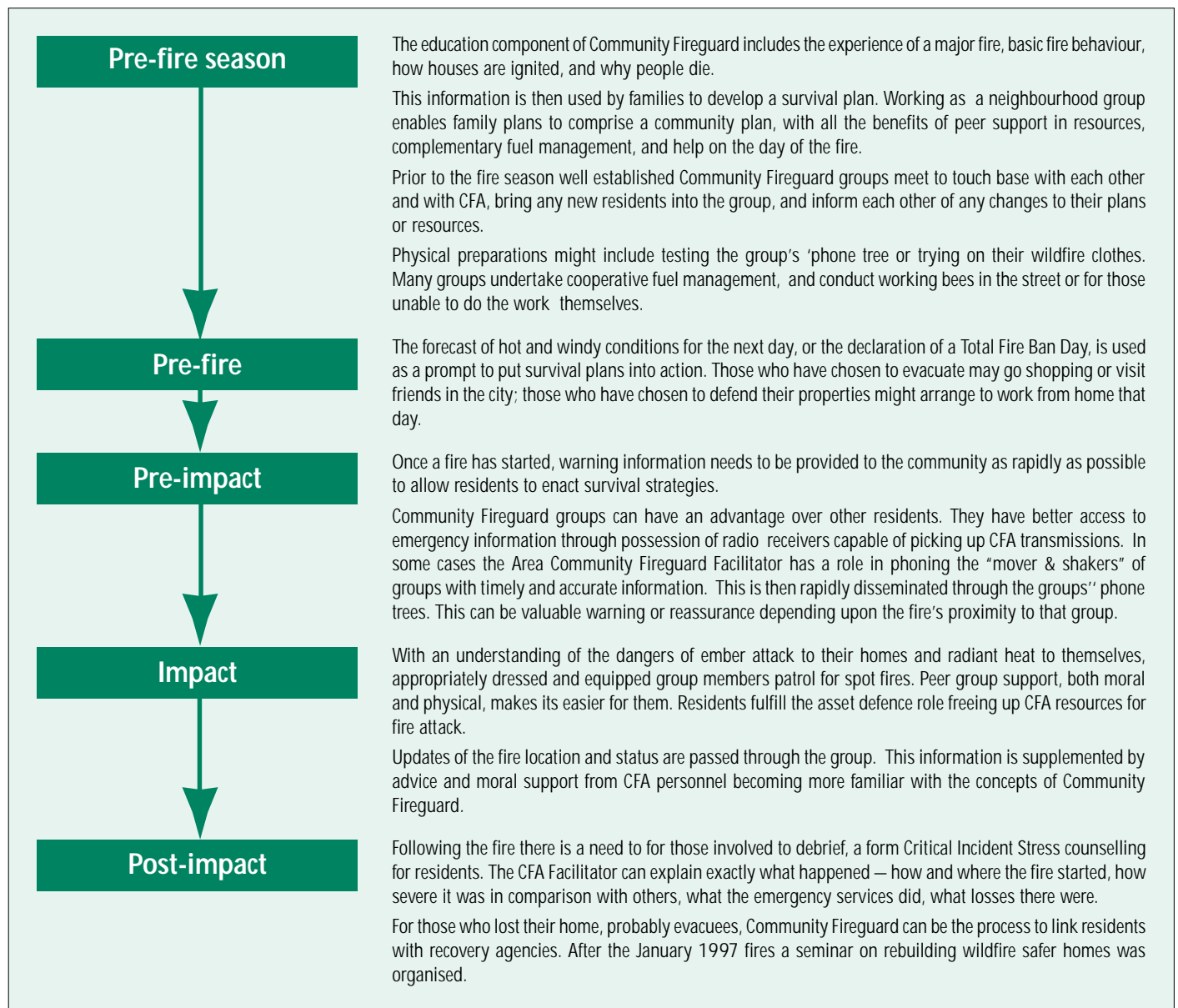


Figure 4: Community Fireguard — a partnership between the community and CFA before, during and after major bushfire.

## Wildfire experience

The real test of a wildfire safety program is wildfire. In the five years that the Community Fireguard program has been in operation a number of groups have been put to the test.

In November 1994 the Moggs Creek group were directly affected by the fire which burnt through their neighbourhood, and it is acknowledged that the fire protection work they had done helped minimise the damage to their properties compared to that suffered by people who had not been involved in the program (Boura, 1995). In February 1995 the Berringa-Enfield fire threatened the South Dereel Community Fireguard group and, although the fire did not actually reach them, their preparation and planning ensured that they received early warning of the fire and in turn notified neighbours who had not attended any Community Fireguard meetings. A private scanner provided regular updates on the fire's progress. Suitably clothed and armed with independent water supplies and home defence equipment all members of the group stayed with their homes ready to protect them if the fire reached their neighbourhood (Boura *et al*, 1995).

Community Fireguard groups also put their plans into action in response to the Dandenong Ranges and Arthurs Seat fires of January 21 1997 and the Kalorama fires of March 1998, although in all cases the fires were contained before they impacted directly on the Community Fireguard streets. Those whose plan was to evacuate left early in a calm manner. Those who stayed were appropriately dressed and equipped and their properties well prepared. Feedback from residents who formed Community Fireguard groups as a response to the 1997 Dandenongs fires shows a marked change in the confidence and ease with which they coped with the 1998 fire. As Dawna Richardson of the Upalong Road Mt. Dandenong Community Fireguard Group wrote the day after the 1998 fire, 'we were much better informed ... we no longer have a victim mentality ... having a plan empowered us'.

During the 1998 Kalorama fires the Yarra Area Facilitators rang the contact people of the 35 Community Fireguard groups in the northern part of the Dandenong Ranges thus activating their phone trees and passing timely and accurate information to an estimated 700 families. A similar role was played by the Midlands Area Facilitator during the Spring Hill fire of March 1998 which destroyed 10 homes. Whilst this information service cannot be guaranteed it points to the potential of community based warning systems.

The high level of preparedness is mirrored by the high level of commitment participants have to the program. In the Yarra Area members of Community Fireguard groups meet several times a year to help the Area facilitators steer the program. Group members did most of the organising of two Fire Safety Expos which attracted a total of more than 3,500 residents. In the Midlands Area, the Wheatsheaf Community Fireguard group publishes its own regular newsletter. Both initiatives were recognised with Community Awards during Victoria's Fire Awareness Week 1997.

## Conclusion

Further reduction in wildfire losses requires the development of a culture of safety within high risk communities. Residents in Community Fireguard streets have come to see sensible levels of fire prevention and preparedness as an important responsibility for people living in their neighbourhood.

The investment by the CFA of time and money in high-risk communities through Community Fireguard can already be seen to have reduced both the immediate cost of wildfire in terms of life and property, and also the unmeasured cost of social dislocation and psychological distress that occurs when vulnerable communities are exposed to major wildfire.

As fire services become more outcome focused and redefine their role as promoting community safety rather than as fighting fires, there will be greater emphasis given to mitigation including community education. Programs such as Community Fireguard which also provide a framework within which to work with the community during the response phase become doubly attractive.

Wildfire will be an ongoing expense, whether it be fire losses, suppression costs or mitigation costs. Fire services are well advised to invest before the fire in creating meaningful partnerships with the community to minimise the impact of wildfire.

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Jon Boura joined the CFA staff in 1993 and worked for two years as Community Fireguard facilitator in the Westernport and Yarra Areas, and then three years as Municipal Programs Coordinator in the Risk Management Department, a role that included management of the Community Fireguard program across the State. He now works on a range of research, policy and training issues in the Wildfire Management Section of the Risk Management Department.

Jon has been a volunteer firefighter for 17 years, the last ten as a second lieutenant of the Upper Beaconsfield Fire Brigade.

## Disaster events calendar

### 17–19 February 1999

**5th Annual California GIS (Geographic Information Systems) Conference**  
*Oakland, California*

**Sponsor:**

California chapters of the Urban and Regional Information Systems Association (URISA).

Topics include emergency management and risk mitigation, urban and regional planning, facilities management, utilities inventory and management, and environmental preservation. Abstracts for presentations are being solicited.

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Web site: <http://www.calgis.org>

### 11–13 May 1999

**PROMIT 98 International Expo: 'Solutions for Natural and Man-Made Disasters' and National Mitigation Summit**

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### 7–19 May 1999

**3rd International Conference on Seismology and Earthquake Engineering**

*Tehran, I.R. Iran*

Organized by International Institute of Earthquake Engineering and Seismology (IIEES)

Call for papers. Prospective authors wishing to participate in the conference are invited to submit their abstracts to the conference coordinator by June 15, 1998.

**Contact:**

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Tehran, I.R. Iran  
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E-mail: [SEE3@DENA.IIEES.AC.IR](mailto:SEE3@DENA.IIEES.AC.IR)

### 17–20 May 1999

**National Fire Protection Association (NFPA) 1999 Annual Meeting**  
*Baltimore, Maryland*

**Contact:**

Casey C. Grant  
Assistant Vice-President  
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One Batterymarch Park  
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Tel: (617) 770-3000  
Fax: (617) 770-0700  
Web site: <http://www.nfpa.org>

### 24–28 May 1999

**23rd Annual Conference of the Association of State Floodplain Managers (ASFPM)**

*Portland, Oregon*

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Fax: (608) 274-0696  
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### 30 August–5 September 1999

**'Rescue Down Under' 1999 International Road Accident Rescue Competition, Symposium, and Expo**  
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