

# Mapping and auditing of bushfire threat to assist community preparedness and response.

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## Abstract:

*A planned course of action which is based on the knowledge and skills of bushfire behaviour and fuel management is more likely to be implemented by individual property owners. Mapping of bushfire threat through identifying hazard, risk and community values is the basis of the self auditing process employed in the Community Fire Safe Program. An innovative mapping procedure directs the property owner to undertake annual planning and preparation throughout the year and specific actions for the fire season and during a fire event. These maps contribute to the Brigade response plans.*

## Introduction

Landowners and residents who live in high fire risk areas have a legal and ethical obligation to maintain and prepare their properties for a bushfire. Often this work is not undertaken because people don't know they have to, don't know where to start or for some it is not a priority or due to age or health issues they are not able to undertake the required work. By mapping the surrounding threat, residents can develop property and people specific responses through out the year so that they are ready for action in the event of a fire. Well prepared properties become part of the overall response plan of the CFS.

## Background

Community Fire Safe began in South Australia with a pilot project in the 1998/9 fire season. In the following season 3 facilitators were employed to expand and implement the program across the high fire risk areas of the Mt Lofty Ranges. Community Fire Safe is a radical departure from the exclusively mass media public awareness campaigns of the past. The role of the facilitators was to:

- ▶ create a clear CFS prevention message and deliver & interpret it to the community;
- ▶ interact with and incorporate Brigades and local government in giving active prevention messages; and
- ▶ adopt an empowerment approach using adult learning principles.

High risk areas were identified by each local government bushfire prevention committee. These locations were rated by brigades as

extreme, very high or high to moderate. Facilitators then began their work using the extremes as a starting point.

Initially the focus of Community Fire Safe was just on getting groups formed in each high risk area on a street by street basis. This led to the recognition that in some areas while the risk was just as high the population density lent itself to holding community meetings rather than being street specific. These meetings were held in places such as Cherryville, Clarendon and Kangarilla; small villages in the peri-urban fringe.

While our targeting of consumers became increasingly more accurate, new tools and models developed out of our practice which simplified fire behaviour theory and transformed it into practical, understandable and applicable actions for individual residents. The goal was and is the development of a household specific Fire Action Plan which identifies an annual program of installation and maintenance for the property which is in keeping with normal upkeep, financial and time budgets and is a specific response plan in the event of a fire.

### **Key Concepts**

Developing an annual property maintenance plan which leads to the establishment of a Fire Action Plan requires each resident to develop approaches and strategies which fit with their governing variables and provides reasons as to why they are taking this particular action. This behaviour change is a function of being motivated to change, having the confidence to change and having the capacity to change. [Letts 1996]

This is a major shift from giving information such as "*Drowsy Drivers Die*". This message assumes that you are able to take the appropriate action. It is essentially telling people what to do. While fires essentially have similar characteristics, each residents situation is different because of siting, building materials, landscaping, residents age and stage, etc.

Our approach places the emphasis on behavioural change through providing a decision making structure and a process of auditing individual properties' threats, identifying what is within the control of the individual, learning the rudiments of the science of fire behaviour particularly in their setting and strategic planning. This work is conducted within an environment that recognises the learning needs of adults.

The following gives an outline of each of the key concepts used:

- 1. Creation of adult learning environment** by providing a clear statement of the intended outcome of the session, topics to be covered and time it will take. The role of the facilitator is to set

the tone of the group and provide access to information and resources. For example making it ok to ask any question or raise issues that might be bothering them, sharing of ideas and experiences, listening with respect, being tolerant with tasteful humour. Once it feels safe to participate, confidence of individuals and confidence in the group processes will allow for greater risks to be taken. Risks such as disclosure of fears and the building of relationships outside of the formal group meetings.

**2. Fire Science:** We start with the fire triangle to identify what constitutes fuel [size, arrangement, target fuel load, type], oxygen [can it be excluded] and heat [discussion of weather, curing etc] and identifying ignition sources. This leads into a deeper discussion of how fires burn, how houses burn down through the impact of spark/embers, radiant heat and direct flame contact and a timeline of the passage of a fire.

**3. Circles of Control and Influence:** Based on the work of Covey [1990] this model assists residents to focus on what they can control rather than what is outside of their sphere. For example focussing on doing the management work on their own property and not projecting their fears/worries about what their neighbour hasn't done.

**4. Audit Process:** The starting point is the equation where:

$$\text{THREAT} = \text{HAZARD} + \text{RISK} + \text{COMMUNITY VALUES}$$

Where

Hazard = the intensity at which a fire will burn once ignited and considers slope, fuel loading, weather conditions

Risk = the potential for fire ignition

Community

Values = the value of the natural and constructed assets which may be destroyed

Once the current Threat level is established, the next task is to identify how the Threat can be reduced to moderate or low.

**5. Basic Requirements:** Reduction of Threat requires the satisfaction of the following conditions:

- a. Establishment of a **defendable zone**. Clearance or thinning of vegetation 20 metres around the house to be used as a refuge from the fire. More may be required if the house is on a slope.
- b. Ability to convert your house to a **spark proof box**. That is ensure most sparks and embers are not able to enter any part of the structure.
- c. Have a **static water supply**. This could be as complex as a barricade of sprinklers or as simple as containers of water, mops and buckets.

These three elements are underpinned by a written family or household action plan which is practiced through fire drills that actively involve every member of the household to the highest level of their potential given age and stage. This process attempts to mentally and emotionally prepare the household and assists their understanding of their capability to stick to the written plan.

The strategies employed to achieve this level of readiness are both passive and active. The annual planning and property maintenance will provide most of the passive protections through weed management, rubbish removal, use of particular structural materials, positioning of water tanks & sheds, grazing practices in rural areas, choice of vegetation, revegetation sites etc. Active strategies include having a practiced written plan, deciding to stay, sprinkler and pump systems etc

**6. Writing a Plan:** This is the hardest part of the process - actually getting the plan written and attached to the fridge or some other public place!

In the urban situation the concentration of the space will dictate when particular activities are required. Eg movement of the wood pile closer to the house in winter, unmown grass etc. However in the peri-urban areas where larger acreages and possibly greater travel [to & from work] distances are involved clear planning is required on how to get the jobs done with the limited time and money budgets. As a result a plan to manage the general tasks is required and Fire Action Plan formulated.

How these concepts come together are contained in Diagram 1.

In summary to make the decision to stay or to go, key concepts need to be understood and applied to the property under review. Mapping

requires the resident to use these key concepts to audit the threat & fuel loads within 5 to 10kms [depending upon the topography] of their property. This is achieved by using their local knowledge to colour fire features on large maps and estimate fuel loads using the CFS Bushfire Threat Assessment Guide [Finney 2002]. As the auditing comes closer to their property [Circle of Control], the focus shifts to the following questions:

- a) what is the potential direct flame contact;
- b) spark and ember attack; and
- c) the impact of radiant heat.

Quite quickly the ability to create the defensible zone, spark proof box and static water supply becomes obvious. Whether staying is the best strategy or leaving early is more appropriate also comes into stark relief.

When joined together these properties potentially create a larger defensible zone. As more of Brigades/Groups develop local area response plans these prepared properties will be part of the solution and not part of the problem.

### **How well does it work? – What the customers say**

Following fires in areas where Community Fire Safe has been active we have undertaken two different types of evaluations. The first was conducted in February 2001 a month after a CFS conducted burnoff 'got away'. It was a telephone survey of both non Community Fire Safe participants and Community Fire participants. Interviews were conducted by Fire Safe Facilitators who had not worked in the area. We sought information on how they reacted and the benefits if any of the program to them. The results raised concern about the lack of written plans, the number who considered late evacuation and the significant numbers who returned home on potentially dangerous roads after hearing about the fire. The lack of communication about the fire from the CFS was a key concern.

The second approach was to hold a focus group and use the ORID method to review the experience and the validity of the information delivered by the program. This session was held March 2004. The comments from this session did not provide any clear view on how involvement in Community Fire Safe assisted their behaviour at the time of the fire. However the experience appears to have made residents more confident and able to analyse their risk and develop appropriate response[s].

The results of both approaches were inconclusive in totally affirming or rejecting the value of the program and it highlights the lack of focus on the recovery phase of fires.

It also highlights that at this stage the area of monitoring and evaluation is the weakest link in our quest to deliver a quality, targeted program across the state.

## **Summary**

This paper addresses how private property owners can be an active but independent part of the response plan of local Brigades. The strength of the program lies in the shift from emergency response only to the planning and preparation phases of managing emergency risk.

This is achieved through:

- ▶ Adopting a 'customer focus' in delivering prevention and community safety messages in positive, safe, small group environments. These messages respond to customers immediate needs, encourage analytical thinking and provide a structure to physically order and arrange their fears.
  
- ▶ Teaching landowners to manage what they can control. This makes for alert, active and alive residents.
  
- ▶ Mapping local bushfire threats and understanding fire behaviour. These are the cornerstones to individual property owners fire planning during the fire danger season and more importantly overall good land management.

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# Diagram 1: The Process of mapping and auditing the current situation

