NSW Fire Brigades Surveying Fire Affected Communities 2001/02

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Between Christmas Eve 2001 and the end of the first week of 2002, bushfires ravaged large areas of NSW, threatening many communities. In the wake of these fires, a group comprising representatives from AFAC, CSIRO, the NSW Fire Brigades (NSWFB) and the Rural Fire Service (RFS) met to discuss ways to derive information on fire, building and human behaviour from these events. One of the outcomes of this meeting was the decision to undertake a comprehensive survey of bushfire-affected communities.

The purpose of the survey was to collect data on peoples' bushfire experiences. The data collection was aimed at improving our understanding of community needs and expectations with respect to bushfire emergencies. The survey also provided an important opportunity for people to express their views on a range of community safety issues and for the fire services' to demonstrate their interest in listening to those views.

A project team was established comprising personnel from NSWFB Fire Investigation and Research Unit, RFS Education Unit and social researchers from FESA and CFA working for AFAC. A questionnaire was designed specifically for the purposes of the project and focused on fire safety issues prior to, during and immediately subsequent to the bushfires. The questions covered the following areas:

- The extent to which the community perceives itself to be at risk from bushfires and its capacity to deal with that risk (susceptibility; vulnerability; resilience, and recoverability);

- The level of community preparedness (awareness, knowledge, planning and physical preparations);

- Interaction between the community and emergency services both in general terms (perception of the role of fire services in dealing with the threat) and during the event (covering such issues as emergency service presence in the local area, evacuation experiences etc), and

- Information flow to the community during the emergency.

A total of 35 questions were included in the questionnaire. They consisted of mainly multiple-choice questions although there was opportunity for respondents to provide more specific short written comments. The final section of the questionnaire invited respondents to write comments on any matter they wished.

The questionnaire was distributed to more than 1300 households in bushfire-affected areas of NSW four to eight weeks after the incident. Residents in four NSWFB and two RFS districts were surveyed with each organisation taking responsibility for the delivery and collection of

the questionnaires in their areas. The criterion for choosing those within the areas who were surveyed was based on proximity to the fire with an attempt made to deliver questionnaires to all houses that were identified as being within 50 metres of the fire front.

The survey has provided a snapshot of the perceptions, attitudes and behaviour of a sample of residents in several fire-affected communities in NSW. The sampling strategy used was aimed at providing results that could be generalised to other similar areas exposed to the risk of bushfire. This paper presents the results obtained from the survey and discusses issues arising from those results that have implications for the way that the fire services seek to interact with the communities that they serve.

NSW FIRE BRIGADES SURVEYING FIRE AFFECTED COMMUNITIES 2001/02

The New South Wales Fire Brigades (NSWFB) Fire Investigation & Research Unit (FIRU) has been developing research initiatives in the area of human behaviour in the built environment since 1997. Part of this process has been the development of Post Incident Analysis (PIA). When the bushfires emergency became apparent in 2001 FIRU explored the possibilities of a large scale PIA. Realising it was beyond the resources of the unit assistance was sought from CSIRO, Australasian Fire Authorities Council (AFAC) and the Rural Fire Service (RFS). After meetings and subsequent discussions it was decided to divide into two areas of study the built environment and the behavioural aspects of the community

The built environment data was collated by CSIRO the behavioural aspects were addressed by FIRU and RFS. AFAC supplied skills and expertise and support for both parts of the project.

OBJECTIVE
The focus of the study was the identification of the way in which people who had been affected by the New South Wales fires not only perceived risk, but also how they understood the risk, how they prepared for the event of a bushfire and their response to the event. The study also sought to investigate how people obtained information during the fires and their interaction with the fire and emergency services. In order to achieve this a questionnaire was constructed to facilitate the collection of information.

The aims of the 2001 – 2002 New South Wales Bushfire Project are listed below.
1. Develop an understanding of the perceptions of communities affected by the 2001 – 2002 bushfires in relation to their levels of risk and their capacity to deal with these risks.
2. Determine the level of participation in preparedness and prevention activities by members of the New South Wales communities affected by the 2001 – 2002 bushfires.
3. Describe how people in the affected communities responded to the bushfire threat.
4. Examine the policy and program implications of people's response to the bushfire risk.
5. Establish an understanding of the way in which information was disseminated during the fire incident, the types of information received by people and the type of information people wished to receive.

Fire services have long promoted the idea that people need to be prepared for bushfire. Typically there has been much generic advice about common preparation measures such as

reducing the amount of fine fuel around the home, ensuring water supplies, clearing gutters and so on. This advice is readily available in brochures and videos produced by fire services as well as community safety or operational personnel. The value of such generic advice is limited, because of the physical setting and the great variation in the social arrangements of households. Consequently, fire services have more recently developed community-based education programs that seek to provide more specific information to residents and actively involve them in developing strategies to deal with the risks that are appropriate to their situation.

One of these initiatives is the Community Fire Unit (CFU) concept. Developed by the NSWFB and instigated after the 1994 bushfires the CFU's have been broadly accepted by both the community, the government of the day and the fire agencies.

CFU's are sponsored by their local NSW Fire Brigade. They are equipped with portable fire protection items such as knapsack pumps portable pumps and hoselines and personal protection equipment. They are educated in basic fire protection and extinguishment theory and are able to assist operational fire units by protecting their immediate property and adjoining properties. This frees up the professional firefighters to engage in the necessary tactics of extinguishment and protection and knowing that there are personnel capable of supporting them.

Four communities for the purposes of the survey, within NSWFB fire districts were chosen due to their position in relation to the fires and the impact the fires made on the local environment. It was also decided that a sample including the CFU's was necessary to gauge the effectiveness of these units. A multi-layered sampling strategy was used in the selection of households to be included in the survey. Using fire spread maps, streets were purposefully selected based on being either inside the fire perimeter or within approximately 50 meters of the fire perimeter. A household sampling strategy was also developed to reduce over-representation of particular locations. In streets were there were relatively few households within a short distance of the fire perimeter all house were included. Where a larger number of houses were located close to the fire perimeter, every second house was included. Where necessary collectors made multiple visits to collect completed questionnaires.

A total of 993 survey forms were returned with above average return rates the lowest being 70% and the highest 92%. the mean average being 80.25%. The difference in sizes of the communities surveyed was due to the differences in population densities on the fire affected areas.

Proportion of Respondents Within Each Age Group

Age Group	Proportion of total sample %
Under 20 years of age	0.8
20 – 29 years of age	5.7
30 – 39 years of age	20.3
40 – 49 years of age	26.0
50 – 59 years of age	22.1
60 – 69 years of age	12.3
70 years of age and Over	10.4

NB:- Figures do not add up to 100% as some respondents did not to respond to all items.

Proportion of respondents participating in community based safety programs by collection area

	Pennant Hills	Helensburgh	Warragamba	Warrimoo	Vincentia	Blaxland's Ridge	Total
Community Fire Unit	6.4	0.2	0.1	2.5	0.2	0.1	9.4
Community Action Group	1.3	0.7	0.2	1.8	0.1	0.3	4.2
Bushfire Blitz	-	-	-	0.1	0.1	-	0.2
Community Fireguard	0.1	-	-	-	-	-	0.1
Local Safety Group	0.2	-	-	0.2	-	0.1	0.4
Fire Service	0.3	0.6	0.4	0.8	0.2	0.9	3.3

NB:- Figures do not add up to 100% as some respondents did not to respond to all items.

The questionnaire was developed specifically for the purposes of the current project and focuses on both general and specific fire safety issues prior to, during and subsequent to the bushfires. The questionnaire consisted of mainly multiple-choice questions although there was opportunity for respondents to provide more specific short written comments. This combination of questions was identified as the most appropriate way in which to elicit responses from people with differing literacy and conceptual levels. A total of 35 questions were included in the questionnaire. The final section of the questionnaire invited respondents to write comments on any matter they wished. Approximately 60% elected to write such comments. The questionnaire sought information in relation to the range of following concepts and issues outlined here.

Perception of risk

This section of the questionnaire was designed to determine people's perception of risk. For the purposes of this project, *vulnerability* was considered to represent how likely it was that householders would be faced with an event, *susceptibility* was considered to represent how often an event was likely to occur, *resilience* was considered to represent how well people felt that they would cope with an event and *recoverability* was considered to represent how easily householders would recover from an event. Respondents were asked how often different emergency situations may occur in their area, how vulnerable people felt where they lived, how resilient people perceived themselves and their families to be, and how easily they thought they could recover from an emergency. A similar four point scale was used to rate a variety of risks according to each element. A new variable using responses on each element was created in order compare the level of perceived risk in relation to different hazards.

Preparedness

Questions contained within this section were designed to identify what people's knowledge levels were in relation to bushfire, preparedness, bushfire safety, what activities they had initiated or intended to initiate in their home and whether or not they had a plan to follow in the event of a fire. A new "knowledge" variable was also created in order to better interpret people's understanding of issues associated with bushfire and bushfire safety and a second variable of "preparation activities" relating to the number of preparation activities undertaken at the household.

A further set of questions were designed to identify what people intended to do prior to the bushfire, what they actually did during the bushfire emergency and what they think they will do in the event of another fire.

Interaction with the emergency services

A number of questions sought to identify how respondents perceived the role of various organisations in relation to fire prevention and suppression and the effectiveness of measures taken by different groups were in preventing and responding to bushfires. Further questions related to the priority perceived to be given currently to different safety initiatives and what priority people would like to be given to these activities. Another question asked respondents about who was involved in fighting the fire in the area around their home. People were also asked if they had been directed to leave their home and how they felt about it

Information flow

The information sought in this section of the questionnaire related to how people first became aware of a fire in their area, what information people received during the fire, where they got this information from and whether it was helpful or not.

Socio-demographic information

The demographic information section sought data about the participant's gender, age, family household structure, and the postcode of the town or suburb in which they lived. Respondents were also asked to identify whether they were a member of a community-based group aimed at addressing bushfire awareness and preparedness as well as whether any member of the household would be interested in joining a group. Finally, respondents were asked to indicate how the recent bushfires affected their property as well as how any disruptions they may have experienced impacted on them and their family.

RESULTS

The results from the survey are important from the perspective of having data to support strategies for public education programs. While it is hoped to carry out further surveys as the situations develop and add to this valuable data base.

One area that stood the in the level of bushfire knowledge this was Warrimoo. This village is positioned in one of the most bushfire prone areas of the Blue Mountains. It could be interpreted that due to the frequency of the bushfires that are encountered and the relatively stable neighbourhood. With less transient occupants local knowledge is retained and used by the community in times of emergency.

The results showed that some knowledge items were responded to correctly by a large majority of respondents. These items included people recognising that in choosing clothing, keeping cool was <u>not</u> the most important consideration (80.1%), that it is safer to stay in a car during a fire than to get out (87.3%) and that solid fuel barbecues can not be used on a total fire ban day (96.2%). Conversely, there were a number of items where a minority of respondents gave correct responses. These included, recognising that houses do not explode in severe bushfires (25.6%), recognising that fire in bushland will only spread at a few kilometres an hour (11.7%) and recognising that a weatherboard house can provide effective protection from a fire (24.4%). Furthermore, 56% of people <u>incorrectly</u> believed that they should ring the fire brigade to find out the location of the fire and 70.1% believed that families with young children should leave the area during a bushfire even at a late stage.

It should be noted that nearly 20% of respondents acknowledge that they did not know what was correct in relation to the personal protection offered by houses and how people died in bushfires. It should also be noted that the items which people generally answered correctly are less significant in relation to people's safety than those that they answered incorrectly.

Preparation Activity	Already	May Do	Would	Not Sure

	Done		Not Do	
Store combustibles away from the house	69.1	23.0	2.80	1.80
Get equipment (e.g., ladders, water containers) to put out spot fires	67.3	20.4	5.60	3.00
Remove fine fuels from a distance of 20-30 meters around the house	65.1	25.5	4.20	1.90
Cover gaps to reduce risk of sparks entering roof and under floor spaces	42.2	42.1	7.50	4.50
Establish a stored water supply	34.2	24.0	28.4	9.60
Prepare kit of personal protective clothing for all household members	25.2	46.1	18.3	6.60
Plan with neighbours how to assist each other	23.1	53.1	12.0	8.00
Set up a phone tree to share information about bushfire incident	15.8	42.3	24.8	13.2
Obtain non-electric pump and hoses	11.6	32.8	39.3	12.4
Prepare a written plan	7.00	45.8	34.2	9.10

While the respondents were in general terms prepared for the approaching fire such as removing the combustibles away from the structure, obtaining equipment to extinguish spot fires. Only 34.2% would obtain any stored water for extinguishing the fire after it had passed and only one quarter had adequate protective clothing to wear.

The suggestion is that the level of overall protection by the respondents for the bushfire event is low and there is an inadequacy in their knowledge.

Response to the bushfire event

Fire services recommend that residents decide prior to a bushfire whether they intend to stay with their property or leave before a fire occurs in the area. Respondents were asked to indicate what they and other household members intended to do. Further, respondents were also asked what they, and other members of the household actually did in response to the fire. Approximately half of the respondents intended to stay and protect their home throughout the fire.

Intended Responses to a Bushfire.

Intended Response	Respondent (%)	Other members of household (%)
Stay and protect house throughout the fire	51.7	27.6
Do as much as possible to protect home but leave if threatened by the fire	22.1	24.0
Stay but leave if told to do so by emergency services	22.8	23.3
Leave as soon as become aware that there is a fire in the area	1.4	5.9
Would not be at home because would have left if it was a day of high fire danger	0.1	0.2
No response	1.9	19.0

The worrying detail is that 22.1% would leave as the fire threatened their home. The chances of survival would drop rapidly as the occupants attempted to leave and if successful, have necessary knowledge of the directional travel of the fire to depart in the correct direction

The implications of these findings are significant for fire service policy in relation to evacuation and advice on how residents should respond to the threat of bushfire. Currently the information that is supplied to the community covers these aspects.
- Action to take when bushfire threatens your home
- Fire safety procedures in and around your home
- Bushfire safety checklist

What is required is inovative use of this information to see that these programs develop into an informative way of educating and informing the community.

Information flow to the community
When asked about what information they would have liked to receive, respondents predominantly indicated that information about the location, direction and severity of the fire in their area would be the highest priority with weather forecasts and implications for the fire situation rated second followed by information on road closures, directions about leaving home and when it was safe to return. This type of information tends to be more practical in nature and specific to the area. The information rated least important was that relating to general information about the fires in New South Wales. These results indicate that the most commonly received information was considered the least important by respondents while the most desired information was received by less than half of the respondents in the effected areas. This suggests that there are major issues for emergency services to address in terms of meeting community information needs during major fires. The need for timely information in a form that is easy to access and comprehend is one of the most difficult tasks for fire services. The easiest form of communication that is not prone to breakdown is that of the

radio, another option is internet usage ,however it is limited due to the technology required. Australia science industry and fire services are preparing for the commencement of the Co-operative Research Centre (CRC) Future studies in this direction are studying combinations of wireless and internet as well as real time access to satellite data.

The majority of people who responded to the questionnaire indicated that they had first become aware of the fire(s) in their area when they saw the fire, smoke or ash (63.8%) while others learnt about the fire from their neighbours (15.9%) or heard an announcement on either the television or radio (13.7%). These results indicate that if people are first finding out about a fire by seeing it for themselves then in many cases this will be when the fire is in their immediate area and therefore leaving may increase the risk to life. This highlights the importance of effective information and warnings to the community.

Areas of that can be improved have emerged from this survey. One is that NSW has a community that can be better informed and educated in the fields of bushfire awareness. One of the directions this may take should be the development of a new stay or go policy. Sydney is unique in the size of the population that live on the urban interface it is still growing and is the largest in the world. There already exists a policy, there are some shortfalls in this system, such as the incident controller imparting to the Police information in a timely manner to enable necessary evacuations to take place. Systems to inform the community in a timely manner as to the dangers that may approach due to a bushfire needs to be developed. It is probable that in time the CRC will facilitate development in the necessary fields. FIRU is a key partner in the Program "C" of the CRC Community Safety. Other aspects that will be developed in conjunction with the CRC such as understanding community needs, increasing community self sufficiency and effective community information flow will see a benefit for communities under these type of emergency situations.