

Understanding the Context: The value of community engagement in bushfire risk communication and education. Observations following the East Coast Tasmania bushfires of December 2006.

Introduction

Bushfire poses an annual threat in many parts of Australia. For those members of the population living in at-risk areas, risk communication and education represent the principal mechanism for enhancing community resilience and people's ability to recover after bushfire. A primary goal of risk communication in this regard is to increase householder preparedness (McLeod, 2003; Paton, 2003a, 2006b). Preparing reduces the risk of damage, loss and injury, and improves homeowners' ability to cope with, adapt to and recover from the consequences of bushfire. In Australia, preparing for bushfire encompasses a diverse variety of protective behaviours that revolve around the proven ability of a homeowner to defend their property if threatened by bushfire. Bushfire risk communication throughout Australia promotes this capacity (AFAC, 2005). However, communicating this message has yielded mixed results (Paton, Bürgelt, & Prior, 2008; Tibbits & Whittaker, 2007).

Part of the difficulty in encouraging homeowners to undertake protective behaviours is determined by the inability of traditional risk communication techniques to accommodate the situational or contextual factors that influence audience interpretation of risk messages (Paton, 2007; Paton et al., 2008). Natural hazard risk communication is traditionally a generic process whereby at-risk individuals or communities are targeted with information and education programs that aim to increase risk perception and encourage people to take actions that minimise the consequences of hazard activity. In most cases, this information is provided in the form of a generic brochure, website, television commercial or booklet, and distributed to those in the community most likely to be exposed to the hazard. What such information can not accommodate is the variability in the audience's environment, social attributes or an individual's psychological characteristics (Mileti & Fitzpatrick, 1992). These contextual factors, which situate risk communication in reality, can influence an individual's receptiveness to, interpretation and understanding of risk communication information, and ultimately whether or not they decide to adopt protective behaviours.

In particular, deciding to adopt protective behaviours is known to be influenced by past experiences with a hazard (Anderson-Berry, 2003; Grothmann & Reusswig, 2006; Lechliter & Willis, 1996; Paton, Johnston, Bebbington, Lai, & Houghton, 2001; Weinstein, 1989), beliefs and attitudes about risk and hazard activity (Johnston, Bebbington, Lai, Houghton, & Paton, 1999; Lindell, 1994; McIvor & Paton, 2007; Paton, 2006b; Paton, Kelly, Bürgelt, & Doherty, 2006), trust in the source of risk information (Paton, 2008; Slovic, 1993), and the social influence of others (Brenkert-Smith, Champ, & Flores, 2006; Carroll, Cohn, Seesholtz, & Higgins, 2005). Furthermore, it is how these extrinsic characteristics are moderated by the psychological characteristics of the individual: whether a person feels capable of undertaking protective behaviours (self-efficacy); how much confidence they have that their actions will help them in the lead up to, and following hazard activity (outcome expectancy); and how prevalent the threat is in their daily life (critical awareness). Consequently, it is not information *per se* that determines action, but the way in which an individual applies that information given their contemporaneous circumstances. If risk communicators fail to acknowledge the diverse influences on, and idiosyncratic nature of the audience, then the message ultimately loses its effectiveness (Slovic, 1986). However, few studies have investigated this phenomenon within communities that have recently been affected by a fire. Furthermore, when past experience is investigated, it tends to focus on the hazard and its consequences and does not consider the social context (e.g., relationship with fire agencies) in this process. This study sought to rectify this gap in the literature and to use people's accounts of their experience to examine how it influences future beliefs, behaviour and relationships.

This paper reports an observational study showing the importance of situational characteristics in determining bushfire preparedness prior to, and recovery following a severe bushfire in north eastern Tasmania, Australia. It demonstrates the reality of the community's use of risk communication information, particularly the variability in the community's receptiveness to, interpretation and understanding of the important messages contained in this information. Recognising the difficulty most organisations face when changing process, some suggestions to increase preparedness for bushfire through more interactive risk communication techniques are proposed.

Background

In mid-December, 2006 bushfire swept through several small communities in the north east of Tasmania (see Figure 1). The bushfire originated from an untended campfire and grew quickly, fuelled by strong winds, extremely dry air, hot weather and dense, dry vegetation. Early on the 11th of December, 2006, property protection began and by the afternoon the small settlement of Falmouth was under threat. At this time unpredicted and extreme weather variability (including drastic changes in relative humidity from 40% to <9%, coupled with wind increases from 20-30 km/h to in excess of 100km/h) contributed to the difficulty of managing the fire. The emergence of these contingent influences on fire behaviour is important from the perspective of understanding inconsistencies between fire agency pronouncements about warnings and community expectations. In particular, the latter have little knowledge of the contingent influences on fire behaviour and this may contribute to their relatively simplistic expectations about warnings (see below). Crews were isolated in Falmouth due to the rate of spread of the fire north and east (travelling two kilometres in 10 minutes), meaning one crew only (from St. Helens to the north) was available to defend properties in Scamander. Until the 13th of December fires were still threatening property in Scamander and Falmouth. Properties in Four Mile Creek (south of Falmouth and Scamander) came under threat on the 14th and these properties were defended with aerial assistance. Fire lines were consolidated and back-burning had controlled the fire by the 15th of December. A total of 28000 hectares was burnt, including 26 homes, four businesses, two orchards and a considerable number of other structures.

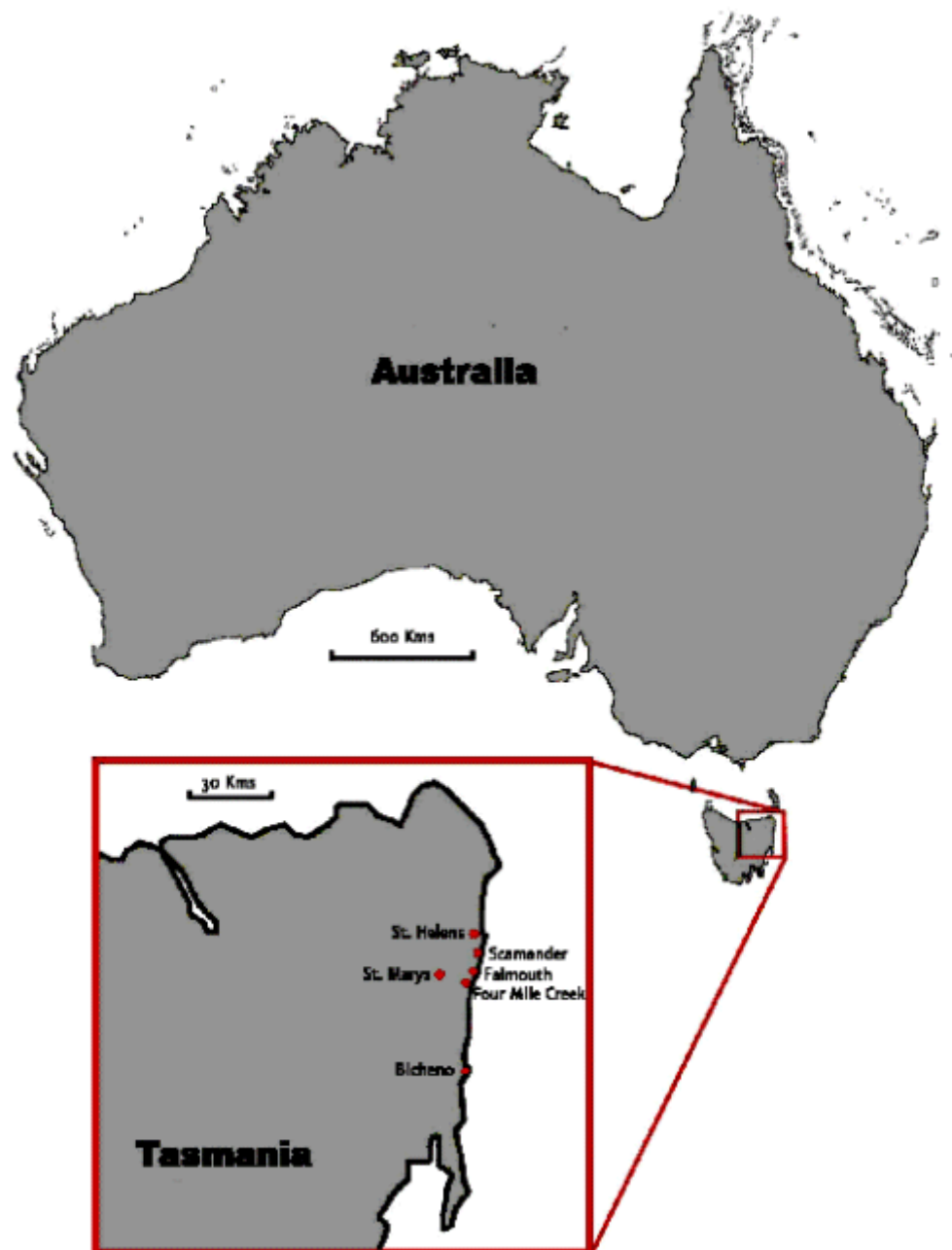


Figure 1. Communities on the east coast of Tasmania, Australia affected by the bushfires of December 2006.

Due to the changing, unpredictable weather conditions, the fire services were unable to provide adequate warning, apart from over local radio stations. In Scamander these messages were not received because the fire had destroyed the local radio transmitting tower. Other towns were kept informed using the local ABC radio network, and a series of community information sessions. Only in Scamander were homeowners evacuated from their properties, and the evacuation included only those people whose properties were assessed as not being adequately prepared for defence without assistance. The evacuations were performed by Police Officers due to a shortage of fire service personnel.

The Tasmania Fire Service triaged homes in the predicted path of the fire from St. Mary's to Bicheno to determine the ability to defend of each property. The fire arrived in Scamander before this was accomplished. Homeowners were informed of this process and the consequences (if their property was declared un-defendable) upfront. This approach was taken because there were too few fire fighting resources for each property to be defended. The use of the limited fire fighting resources was maximised by keeping fire crews continuously mobile, allowing them to assist residents, and move on as the fire front

threatened new homes, thus preventing fire crews from becoming isolated by the fast moving front.

A community recovery study was carried out following the fire. This was co-ordinated by representatives from the local shire council, and culminated in a series of community de-briefings well after the fire. The Tasmania Fire Service *Prepare to Survive* DVD was sent to all homes affected by the fire in November, 2006. It provides current best-practice bushfire preparedness information for the homeowner (although this does not mean that it was watched/read or acted upon).

Methodology

Recruitment of interviewees

In this qualitative study, in-depth, semi-structured interviews were conducted with individuals who experienced firsthand the bushfires in north eastern Tasmania. Interviewees were initially recruited through the Community Development Officer (CDO) from the local council. After discussions with the CDO, an information sheet and informed consent form were distributed to households by the CDO in bushfire-affected areas. This methodology was utilised because the researchers believed a higher response rate could be achieved if the interviewees were recruited by a local organisation.

Interested individuals were asked to fill out the consent form, supply contact details, and return this information to the CDO, who then provided this information to the researchers. Over a period of 5 weeks only three individuals responded in this fashion. One respondent could not be reached on the contact details that were provided. A fourth individual, who did not receive the information from the CDO, contacted the researchers directly after obtaining the contact details from a friend. All interviews were conducted by telephone in September 2007 during the time when people should be actively thinking about preparing for bushfires. Interviews ranged from 45 minutes to 1.5 hours in duration.

To increase the number of interviewees, the researchers sought further involvement by applying a snow-balling technique that involved asking interviewees to suggest individuals they knew who might be interested in participating in the research. Informed consent documentation was forwarded directly to these individuals. The interviews were conducted with these individuals only after receipt of the informed consent forms by the researchers. Only a further two interviewees were recruited using this technique, making a total of five interviewees. Several factors may have contributed to the low participation rate in this research, prime among these is likely to be the loss of trust in the local council during recovery after the fires (this was supported by anecdotal data and is discussed below). The CDO was a representative of this civic agency.

Interview schedule

Using semi-structured interviews, respondents were invited to relate their experiences of the bushfire, to discuss the relationship between this experience and their level of preparedness, and to discuss why they prepared and whether their experience influenced their preparedness beliefs and actions. The interview was structured to elicit the reasoning behind respondents deciding to prepare or choosing not to prepare, and the contextual factors (e.g., information available, message content, interpretation of their fire experience etc) that influenced their future decisions about whether they prepared or not. It also examined how this decision making process influenced what preparations people had actually made. In the context of their experiences with the bushfire, interviews elicited information on people's knowledge of preparedness for bushfires, and how they felt this influenced their awareness of the accessibility, amount and quality of information that could help in the preparedness decision making process. In relation to the information that they had received from any source, they were asked to describe how that information was used and how valuable they found it when forming their decisions about preparing or otherwise. Lastly, given their experiences, they were asked to detail what other information they thought would have been useful in helping them to prepare for the bushfire that had not been available to them prior to the event.

Interview organisation and analysis

In-depth, semi-structured interviews were conducted. Interview participants were theoretically sampled from those respondents whose perspectives could shed light on the relationship between the experience of a fire, response to a fire, and the relationship between these experiences and attitudes to bushfire preparedness. Because research into the relationship between fire experience and future attitudes to preparedness and those responsible for facilitating preparedness is limited, this case sampling approach was adopted to increase opportunities to compare the underlying conditions, patterns of interaction, responses, and consequences associated with people's decisions about future preparation (Flick, 2002).

Each interview was fully transcribed and systematically analysed using grounded theory analysis techniques (i.e. open, axial, and selective coding, paradigm model, constant comparison between individual cases, asking questions of the data, creating networks among the emerging concepts) (Strauss & Corbin, 1998). Management and analysis of the interview data was carried out using NVivo 7 qualitative analysis software. The analysis identified important relationships between information and preparedness in the lead up to the bushfire, and showed the variability in application of the available risk information. The analysis also detected formative interactions between information, experience and outcome expectancy.

Summary and discussion of interview data

Analysis of the interview data revealed several key findings that have implications for improved risk communication processes and the adoption of protective behaviours. In particular, the findings emphasise a need for this process to accommodate the complex patterns of interaction that exist between people and fire agencies and the perceptions and beliefs that influence how both parties act. Within the risk communication process, it is also important that fire agencies must accept that the quality of their relationship with a community is as important as the information they provide. Firstly, householders have an unrealistic perception of the extent and effectiveness of their preparations. Secondly, people's perception of fire agencies risk communication, their approaches to fire fighting, and the recovery process adopted following a severe bushfire influence community cohesion and trust in the agencies responsible for risk communication. Finally, following from the latter, the data highlight the need for risk communication to be based on community engagement principles and practices (e.g., involve extensive community involvement). Each finding is explained and discussed below.

Householder preparedness

The level of preparedness among the interviewees was variable. While most respondents had undertaken some form of protective behaviour, many of these actions were conducted only after receiving warning from the emergency services about the approaching fire, or once it was obvious that the bushfire was getting very close. For the most part, interviewees began to undertake preparedness activities with only enough time to effect minimal preparations before they were either evacuated by emergency personnel, or the fire front had reached their property. While people were preparing (albeit too late in many cases), this was due more to the presence of proximal cues (e.g., visibility of flames coming their way) and less to the effectiveness of the risk communication strategies adopted by fire agencies.

The interview data also highlighted the fact that people tended to make only minimal preparations because they were unaware of the approaching fire. That is, people started to prepare their properties only when they were warned that the fire was actually approaching (warnings were received in some cases only 30 minutes to one hour before the fire front arrived) from the emergency services as a cue to begin preparing their properties. This was particularly the case in Scamander, which came under threat from the fire after a strong and unexpected change in the wind direction. Where individuals had existing significant preparations (like a petrol water pump, or roof-top sprinkler system), they had time only to ensure these systems were operational. Clearly, warning information about a fire that was already established were either not received or people were treating this information as irrelevant for them because they did not perceive themselves as being threatened until more visible cues were present, or they were directly approached by fire service personnel. In addition to the fact that it increases people's risk, the latter indicates that fire agencies must temporarily redeploy personnel from fire fighting duties to warning duties.

In this study, the data suggests that respondents' reticence about early preparedness can be traced to the influence of two situational characteristics. Firstly, the interviewees showed a great reliance on the fire services to advise them on when to effect protective behaviours, using the bushfire warnings for this purpose (whereas fire agencies expect that the people are preparing at the start of the season when they first start their public education program). Furthermore, the contingent influences on fire behaviour introduced above make issuing clear warnings problematic as a result of the subsequent fire behaviour being influenced by dynamic meteorological and topographic factors. Consequently, peoples' actions often run contrary to the preparedness message outlined in the *Prepare to Survive* DVD, which states that individuals should plan (at the start of the season) whether to 'stay and defend' their properties or 'leave early'. This message has not generated the desired outcome, either because people did not receive the DVD, or received it, but did not watch it because it was not recognised as important. This should not automatically be taken to imply that people do not treat fire safety issues as important. Rather the timing of formal public education programs often fail to accommodate the salience of fire safety for people. That is, fire safety messages have to compete with more pressing issues (e.g., health care, employment) in peoples' lives. This means that it takes the presence of proximal cues to elevate bushfire preparedness to a level that motivates people to act. In the absence of more direct community engagement, agencies are unlikely to be able to accommodate this issue.

A greater reliance on the fire services may be driven by the interviewees' unfamiliarity with severe bushfire. Large, destructive bushfires are uncommon on Tasmania's east coast, the last large bushfire occurring in the region more than 45 years ago. There is also a high proportion of 'tree-change' and 'sea-change' residents, recently arrived from outside of Tasmania (in the last 5-7 years), often from large cities, who have relocated seeking a lifestyle change and have little experience of bushfire beyond what they have seen or heard in the media. Consequently, residents are either unable to develop a practical knowledge of what to do in such a bushfire situation (because of the low fire frequency), or have no experience or critical awareness of bushfire (because they have not lived in areas at risk from bushfire). Paton (2007) suggests that both frequency of hazard (generating familiarity) and information availability (generating knowledge) influence the level of trust in emergency management agencies to look after residents. If people have no experience of bushfire, or do not (or cannot) utilise risk information provided to them, then their reliance on emergency management agencies may be heightened.

Another factor driving people's reticence appears to be a misperception about the severity of bushfire. Underestimation of the severity of low-probability risks, such as bushfire, is a common phenomenon (Kahneman & Tversky, 1979; Keller, Siegrist, & Gutscher, 2006). When relating their experiences, several interviewees reflected on how ill-prepared they were in the face of such an extreme bushfire situation. This was particularly consequential for the more recent arrivals to the area. Two interviewees referred to experiences they had with bushfires in their youth (up to 40 years ago), where they fought a bushfire with branches or wet Hessian sacks. For both interviewees these experiences had influenced their perception of the way a bushfire could be fought, and their idea of how severe a fire could be. Only one of the interviewees was prepared for the ferocity of the fire, and this knowledge had been passed to her by a friend from interstate.

A direct result of this misperception was a belief among the interviewees that they would be able to defend their homes without implementing significant preparations. That is, respondents believed that any bushfire they may face would be relatively mild and controllable, leading them to place unrealistic confidence in their preparations. As such, respondents remained with their homes in a situation where they should probably have left. One interviewee in this situation, realising that his preparations would be ineffectual, fled on foot from his home with his wife, whose shoe was scorched by the fire as they ran. Two other interviewees in this situation, knowing their preparations would not be sufficient, packed their cars with important possessions in case the need to leave the home arose. Both of these examples of interviewee behaviour during a bushfire suggest that individuals believe that they can hedge their ability to defend their home against the possibility that if they cannot, having the car ready to go at the last minute will be their alternative course of action.

Similar attitudes were prevalent among residents on the peri-urban fringe of Hobart (Prior, unpublished)

and in rural Victoria (Tibbits & Whittaker, 2007), indicating this behaviour is by no means rare. 'Bet-hedging' behaviour suggests that individuals are interpreting the 'stay and defend or leave early' message incorrectly. At the very least, the meaning of 'early' for a householder with a strong attachment to their home, is quite different to the meaning attributed to 'early' by emergency managers. One interviewee, who had watched the *Prepare to Survive* DVD, suggested people may have misinterpreted the concept of 'early' in this case because the DVD stated that "you will get ample warning" if you choose to leave, when in fact they had not. The issue here seems to lie with differences in the way fire agencies and citizens interpret 'ample warning' (see above) and once again reiterates the benefits that can accrue from risk communication involving more direct engagement. Only through the active discussion of issues can such interpretive problems be identified and addressed before the people have to act.

Tibbits and Whittaker (2007) also observed that the 'leave early' message in Australian bushfire risk communication requires clarification. This behaviour may also be explained by the 'risk-as-feelings' model of decision making proposed by Loewenstein, Hsee, Weber and Welch (2001). They suggest that individuals' decisions are influenced by affect experienced at the moment of decision making. This theory would support the bet hedging observed in this study where decision making is driven by emotions, which override the cognitive, rational, and early appraisal of a threat. In addition, the psychological stress likely to occur at this time would also affect the quality of people's information processing and their decision making.

Low preparedness levels may also reflect the evolving nature of the bushfire risk communication message in Australia. At present the Australasian Fire Authorities Council (AFAC, 2005, p. 4) recommends that fire and land management agencies encourage householders "to take responsibility for the own preparedness and safety in bushfires" and that "householders should be provided with knowledge and skills to enable them to prepare themselves and their property adequately to survive a bushfire, and to enable them to decide whether or not they will remain with their property if a bushfire threatens".

While interviewees understand this position, it is contrary to the historical bushfire risk communication information that older residents have accessed or been provided with and may cause confusion regarding the best course of action. It also contains several ambiguous words. For example, 'ample' might mean mowing the lawn regularly, or the adoption all recommended protective measures (Paton et al., 2008). Historical and interpretive confusion may diffuse throughout the community (Rogers, 1995). One interviewee who has resided in Scamander for 27 years, talked about seeking bushfire preparedness information when he originally settled in the area, but had since sought no further information, and did not receive the *Prepare to Survive* DVD first issued in 2006/07. The original information he sought identified staying in the home as an unsafe option during a bushfire, and highlighted the protective ability (responsibility) of fire services during a bushfire event. Thus, the changing nature and content of bushfire risk communication may be negating the current important (and correct) preparation messages. While fire agencies' positions on this have changed, this has not been accompanied by the kind of community discussions required to ensure that people not only know that the position on an important issue has changed, but also why it has changed. Unless people can directly follow the logic underlying a protective measure, they are less likely to adopt it (Paton, McClure, & Burgelt, 2006). The decision not to prepare in this case is driven partly by a lack of knowledge or choice not to seek knowledge about preparing, and partly due to a belief that fire management agencies are responsible for community safety during a bushfire. A similar issue was identified by Ballantyne, Paton, Johnston, Kozuch and Daly (2000) in their investigation into volcanic hazard preparedness in New Zealand.

Agency trust and community cohesion

As well as influencing preparedness, situational factors also had an impact on agency trust and sense of community within the fire-affected communities. Evidence suggests that bushfire events can increase sense of community (Paton et al., 2008), when community members essentially 'pull together' to help one another in a time of hardship. Carroll et al. (2005) also showed that sense of community can be degraded when blame is passed, and the distribution of fire fighting resources are questioned. The current study found that the activity of emergency management agencies and civic authorities, during and after the fire, influenced the community's trust in those agencies, and generated ill-feelings between affected members

of the community, causing the community “to turn in on itself”, as one interviewee articulated.

While it is difficult for authorities to anticipate the behaviour of severe bushfires, discrepancies between the bushfire preparedness information provided in the *Prepare to Survive* DVD, and the reality of warning people about the approaching bushfire, were a cause of distrust for interviewees in Scamander particularly. One interviewee, who was well prepared, expressed her disappointment in the lack of adequate warning before the fire front arrived as an issue relating to the collective preparedness of the community. She recognised that other members of the community were under-prepared, and would require early warning in order to effect any significant preparations. She referred to a neighbour who had tried to start his petrol water pump after receiving 30 minutes notice before the arrival of the fire front. When it could not be started, and with minutes remaining before the front reached his house, he left everything and fled. For that interviewee, a lack of adequate warning (from the respondents’ perspective – fire agencies may assume that people have considered and practiced their preparedness weeks or months beforehand) reduced the collective preparedness of her street, and although she was well prepared, she felt this put her in danger of suffering the same loss as her poorly prepared neighbour, whose house was destroyed. She noted that the *Prepare to Survive* DVD clearly stated that “you would receive ample warning”, which she felt would cause less critically aware individuals in the community to place a reliance on the emergency services when a threat was imminent. For this interviewee the social contract between her and the emergency services had been broken, and she no longer trusted the services to ensure her community’s safety. These comments highlight another reason why risk communication practice must embrace community engagement principles. The nature of bushfire hazards requires a level of collective preparedness that is unique. The preparations conducted by one household may be negated if their neighbours have not done likewise. A lack of fire agency engagement with the community, and lack of discussion amongst members of the above neighbourhood prior to this event occurring, clearly increased the risk for all concerned.

At the individual level, the tendency to attribute responsibility on emergency management services in the event of a natural hazard has been demonstrated in a number of circumstances (Ballantyne et al., 2000; Carroll et al., 2005; Kumagai, Bliss, Daniels, & Carroll, 2004). During the East Coast Fires the emergency management services actively prioritised the defence of properties in the path of the fire front using a triage approach. In order to distribute limited fire fighting resources, and to limit the risk of injury to fire fighting personnel (K. Burns, personal communication, July 20, 2007), only houses that were clearly well prepared (with defensible space etc) were protected. This (perceived unequal) distribution of resources created issues of trust for the services, and generated a sense of divisiveness among community members, some of whose homes were destroyed, while their neighbour’s homes remained intact. While the AFAC recommendations (2005, p. 5) make clear that “fire fighting resources are likely to be allocated where they will be most effective” and that “fire fighters may not defend unprepared properties”, these messages did not reach the community. Even if they do, differences in householder beliefs about adequate preparedness (e.g., some people believe that regularly mowing the lawn constitutes adequate preparation) (Paton et al., 2008) can create considerable scope for confusion between the expectations of householders and fire agency personnel. Furthermore, this problem can be compounded by differences in perceived responsibility for bushfire mitigation and management. Whereas fire agencies advocate householder responsibility, the latter often believe that responsibility for all aspects of bushfire management and mitigation rests with the agencies (Paton & Wright, 2008). Also, the fact that some community members were well prepared, and successfully defended their homes added to a degradation of community spirit. One interviewee suggested that those people who fled “felt foolish” that they had not done more, especially in cases where their homes had been saved by neighbours who had remained in the street, and were able to extinguish spot fires at properties other than their own.

The recovery process following the bushfires also played an important role in the reduction of community trust in emergency management services and the local council. All interviewees admitted to suffering varying levels of depression, and indicated there was very little effort made to formally organise a meeting or debriefings that would help the community to gain some ‘closure’ after the event.

A debriefing was provided by the fire service, but for most it was too little, too late (coming approximately

12 weeks after the fire). A well managed recovery process should provide civic agencies with a chance to outline and justify their actions, provide support to the community (CDRSS, 2006; Paton, 2003b), and undertake corrective mitigation (Berke, Kartez, & Wenger, 1993; Reddy, 2000), while empowering the community (Chen, Liu, & Chan, 2006; Rich, Edelstein, Hallman, & Wandersman, 1995). In communities that have shared the 'common fate' of a bushfire, the sense of community that can arise can act as a catalyst for the development of community resilience (Paton et al., 2006). In this case, however, interviewees felt that an opportunity to build a strong and supportive community had been lost. This was further exaggerated by the organisation of a recovery 'party' in a neighbouring (but unaffected) town. This occasion was organised by the local council, which was based in the unaffected town, as an opportunity for the community to thank the emergency services, and to give something back to the fire fighters who had supported them. However, interviewees in the towns actually affected by the fire were very unhappy that this had occurred (and those who chose to be interviewed indicated they had boycotted this event). The increased likelihood for distrust of the council will make future efforts to ensure communities are prepared more difficult.

Interactive risk communication

Interviewees identified that in order to increase community preparedness a more interactive approach should be taken in the risk communication process. That is, it is necessary to complement existing mass communication strategies with those that embrace community engagement principles. Involving the community in disaster mitigation promotes collective confidence in emergency management agencies, increases agency knowledge of the community's requirements, and encourages community self-reliance (Cottrell, 2005; Lichterman, 2000; Newport & Jawahar, 2003). Interviewees in this study believed that having the opportunity to discuss preparedness with agency representatives would create stronger mutual understanding of agency and community issues relevant to preparing for bushfire. Importantly, it would also provide a medium in which the misunderstandings alluded to in previous paragraphs would be reduced or eliminated. It would also provide opportunities for fire agencies to enhance people's knowledge of the contingent influences on fire behaviour that can make giving specific warning messages impossible. Building people's knowledge in this regard contributes to their developing more comprehensive models of the hazard and this, in turn, contributes to the level of preparedness and planning people undertake (Paton, McClure et al., 2006). It would also increase opportunities for agencies to become familiar with the situational characteristics of the community and provide a foundation for risk management strategies to be tailored to the characteristics, needs, expectations and capabilities of each community. Also, communities would more fully appreciate the need for preparedness, the imperatives that bushfire risk communication is founded on, and the mechanics of successfully fighting a severe bushfire.

Interviewees also felt that it was important for them to discuss preparations with other members of their community, particularly for people who are recent arrivals to the area, or who had little experience of bushfire. For these people, other more experienced members of the community represent a source of practical, simple, and understandable bushfire risk information. Given that traditional risk communication techniques generally do not increase levels of community preparedness markedly, all available resources (including the community) should be utilised to generate and sustain preparedness levels. Interactive risk communication would not only provide pertinent information to homeowners, that information would be contextually relevant to the community receiving it.

Conclusion

The generation of homeowner preparedness is clearly the central objective of bushfire risk communication. However, while people living in at-risk areas may be receiving the risk communication information provided to them, the way they interpret and act on this information seems inconsistent with the messenger's intent. In particular, people are using warnings of bushfire threat as cues to prepare, and misinterpreting the 'leave early' message, actions that are rendered even more serious by the underestimation of bushfire severity. These results suggest that homeowners are making critical safety decisions about preparing and staying to defend, and about leaving, at the last possible opportunity.

By drawing upon community members' accounts of the relationship between risk communication, community preparedness, and the experience of a substantial bushfire, the present study highlights the necessity of addressing situational community characteristics when delivering bushfire risk communication information and when managing the consequences of a fire event. The diversity in experiences, backgrounds and composition of communities exposed to bushfire in Australia is immense (Cottrell, 2005), and utilising a standardised message to promote the adoption of protective behaviours that are meaningful and understandable is consequently problematic. In order to more effectively address this diversity, risk communication activities should allow flexibility and encourage community involvement, taking an integrated, participatory rather than prescriptive approach to develop information dissemination and community engagement strategies to address issues such as homeowner preparedness, agency trust and sense of community.

Integrated risk communication could provide a forum where issues about preparing can be highlighted, discussed and addressed collectively, allowing information from expert sources to be rendered meaningful and understandable, then diffused more widely by critically aware and knowledgeable members of the community. A collaborative approach such as this would also ensure risk communicators provided information that was contextually relevant for each community.

Empowering the community in this way may also generate a stronger sense of community by fostering householders' reliance on their peers in the community, instead of on the fire services. Interviewees reflected on the low level of interaction that they shared with their fellow community members prior to the fires. This can be partly explained by the mix of old and new residents, and partly because property sizes on the urban fringe in the areas studied are relatively large, meaning neighbours are distant from one another and are less likely to engage in regular interaction. Feelings of separation within the communities were exacerbated as a result of the way in which the fire service chose to defend properties – using a triage technique based on property defensibility that was first applied in this situation, and which no one in the community had previously experienced.

Taking an approach to risk communication that encourages community members to interact with each other (and the emergency services) and share place-specific information about their bushfire experiences would be a crucial step toward generating a higher level of collective preparedness and stronger sense of community. It would also increase familiarity with the key messages in bushfire risk communication, and cultivate confidence in those messages and the techniques that emergency services use when responding to natural hazards. It would also provide fire agencies with access to a valuable source of feedback from those they seek to protect and provide them with the raw materials from which more effective content and delivery mechanisms can be developed and delivered.

In order for homeowners to actually implement the preparedness strategies advocated by the emergency services, they must trust the message and the messenger implicitly. This is especially the case in low-probability hazards such as bushfire, or when the community's knowledge of protective behaviour is limited. Discrepancies between information provided in risk communication products, and the experiences of homeowners during these bushfires contributed to a diminution of trust between agencies and the community. While the *Prepare to Survive* DVD contains all of the important bushfire preparedness messages, some homeowners who had seen it had not made bushfire plans or effected any significant preparations before receiving a warning from emergency services that the fire was very close. These residents were waiting for the "ample warning" they were assured in the DVD. This is clearly a fundamental flaw in homeowner planning and preparedness, but it also suggests that risk communication messages encouraging bushfire preparedness planning are being misinterpreted, in part leading to the attribution of responsibility to the fire services. When those services fail to uphold their responsibility (as it is perceived by the homeowner), and the consequences are dramatic, then they are bound to be blamed for those consequences.

The policy position regarding bushfire preparedness is sound, and based on empirical research, evidence and experience (AFAC, 2005; McLeod, 2003). However, communicating this policy to homeowners in a way that is both meaningful and understandable is difficult if the community is not a part of that dialogue.

Interactive risk communication will empower communities and encourage them to accept risk and become more knowledgeable about the threats they face. It will help the community take responsibility for their collective preparedness, recognise and implement the salient actions outlined in the bushfire risk communication message, and will foster trust in the message and the messenger (Paton, 2006a). The result will be communities that are better prepared to confront bushfire, and to recover from its consequences. Importantly, it will increase the likelihood that the recovery provides the foundation for a more informed, better prepared community.

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