Community and fire service perceptions of bushfire issues in Tamborine Mountain: what's the difference?

Sally Bushnell, Luke Balcombe and Alison Cottrell describe the similarities and differences in perceptions between Tamborine Mountain fire services and their community, and discuss the implications.

Abstract

The social construction of risk explains that public perceptions of an objective hazard are often shaped through social and cultural processes. Hazard managers tend to focus on the objective risk, and as a result can often perceive a risk and related issues very differently to the community they are servicing. This has important implications for hazard management. This paper reports on research that investigated similarities and differences in perceptions of community bushfire risk and issues between the community and fire services in Tamborine Mountain in Queensland Australia. It discusses the implications for bushfire service delivery, and also provides an example of how understanding bushfire hazard perceptions and other issues within a community can give direction to locally-specific strategies targeting community safety.

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Firefighter wearing breathing gear as bushfires rage.

Introduction

This paper reports the results of a case study undertaken in Tamborine Mountain in southeast Queensland. It highlights similarities and differences in perceptions of community bushfire risk and issues between the community and fire services in the locality, and it discusses the implications for bushfire service delivery. It also provides an example of how understanding bushfire hazard perceptions and other issues within a community can give direction to locally-specific strategies targeting community safety.

Risk can be defined as the product of the probability and consequences (magnitude and severity) of an adverse event (Bradbury, 1989). Negative risk increases as the probability of a negative event increases, and as the expected consequences grow worse. This combination of probability and consequence results in ambiguity and consequently, perceptions of risk can be complex and are not homogenous (Sjoberg, 1999). In the context of hazard management, this is important because it can help explain the often large variation in perceived risk between the experts, or hazard managers, and the public. Experts tend to focus on the probability of a risk, and calculations are often technically complex, due to the need for theoretical models to achieve greater precision when dealing with rare events (small probabilities) that have large consequences (Sjoberg, 1999). Probability is a difficult concept for the public to understand; consequences are much less complex, easier to relate to and therefore understand. Thus, public judgements of risk are often based on consequences (Sjoberg, 1999; Renn, 2003). However even this process can become complex when considered within the context of everyday life which includes other risks, personal and social matters. Such a process can be described as the social construction of risk; the objective hazard is mediated through social and cultural

processes (Lupton, 1999). This can be a difficult concept to understand and accept, however public perceptions often drive priorities on where and how to reduce or manage risk, it is therefore important that perceptions are understood as it leads to effective policy (Byrd and VanDerslice 1996; Renn, 2003).

Understanding how a risk is perceived is a challenging process accentuated by the fact that a certain risk can be perceived very differently by individuals both within and between localities (Bushnell and Cottrell, 2007). The case study described here goes some way to illustrating the complexities of this type of issue.

Methodology

Study area

Tamborine Mountain is located 60km south of Brisbane in southeast Queensland (Figure 1). The area is characterised by escarpments, tall open forests and sub-tropical rainforests, and is consequently picturesque. The study area is peri-urban and thus incorporates residential, rural and farming properties. The level of bushfire risk is considered high by the Queensland Rural Fire Service (QFRS), and in recent times there have been no significant bushfire events. Extensive bushfires occurred at Tamborine in the 1960s, and in 2004 there were bushfires in an adjacent area. The most common natural hazard in the area is storms. Four fire brigades service the area, these include Auxiliary Fire Brigades (AFB) and Rural Fire Brigades (RFB). AFBs service urban areas and members are paid part-time, RFBs primarily service rural areas and members are voluntary. Queensland Parks and Wildlife Service (QPWS) and the Defence Force also have fire-fighting capabilities. The main response activity of the fire services in the area is for motor vehicle accidents.

A mixed methods approach was used for data collection, including individual and group interviews, document analysis and a mail survey.

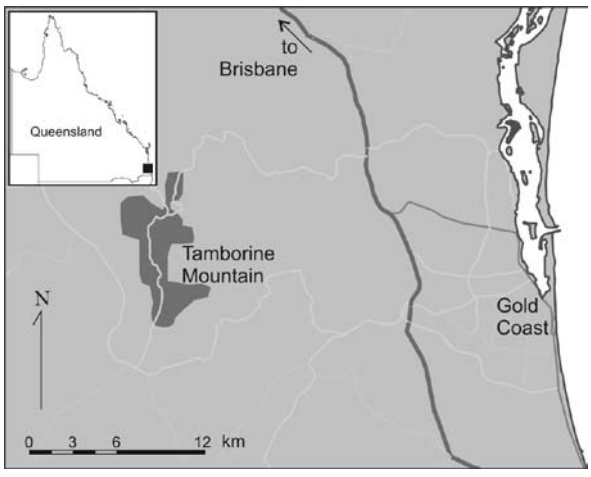

Figure 1. Tamborine Mountain study area in south east Queensland.

Interviews

Initially, a number of individuals from local and state government and volunteer organisations were interviewed. Group interviews were undertaken with members of the local fire brigades and with members of local community groups. This was to identify local bushfire issues in the area and to guide questionnaire development. It also provided the means to document fire brigade perceptions of community fire issues, that is their perspective on how the community perceives the bushfire risk and other bushfire related issues.

Mail survey

A four-page 41 item self-completion questionnaire was designed to collect data on a wide range of social factors including: demographics and property/lifestyle factors; hazard experience; perception of local hazard risks; knowledge and attitudes in relation to bushfire hazard management; views on responsibility for bushfire-related activities; participation in bushfire preparation activities; and preferences for bushfire information. The questionnaire was trialled in a pilot survey and appropriate changes made before the final version.

Data collection

In total, 500 questionnaires were delivered in May 2005. Questionnaires were hand-delivered to mailboxes based on a representative sampling methodology. Respondents were asked to return surveys by mail using the postage-paid return envelopes provided with the survey. An overall response rate of 33% was achieved with a total of 163 completed surveys returned.

Data analysis

Data for all survey questions were analysed descriptively. For quantitative data, Chi-square tests were used to test for statistically significant relationships between variables of interest. For qualitative data, themes and topics were identified from comments provided by respondents.

Results

A number of similarities and differences in perceptions about bushfire issues between the community and fire services were identified, and these relate to risk perception, roles and responsibilities and bushfire hazard management.

Risk perception

Interviews with fire service members indicated that there were strong views within the community regarding bushfire risk. The environment is an emotive issue for many people, and this can take precedence over bushfire issues. One brigade member commented that "views regarding bushfire risk are challenged by environmental groups who are passionate about the issue". Interviews with community groups confirmed that development of rainforest and degradation of the natural landscape in the area is often of more concern to residents than bushfire. The community survey revealed that 86% of respondents had moved to Tamborine Mountain to be close to nature (Table 1), and comments provided by respondents revealed a common theme: living in a bushland or rainforest setting is often more important than the risk of bushfire. Fire services suggested that this orientation of values toward the natural environment was linked with a lack of awareness of bushfire risk. For example, it was said that "people are unaware of bushfire risk and don't think about things they should do, even when they build in risky areas". However, the survey data reveals that there is a general awareness within the community; most respondents (79%) indicated that they have thought about fire risks (Table 1), and analyses found no significant relationships between thinking about fire risks and whether the respondents had moved to the area to be close to nature or whether they believe the bush should be left untouched. Comments suggest that residents living within a high fire risk setting choose to do so in order to benefit from living within nature. One respondent commented: "Love trees. Want to be surrounded by them. Fire is a concern but that is my choice".

Table 1: Respondent agreeement with statements about bushfire risk

Perceptions of bushfire risk	Strongly Agree %	Slightly Agree %	Neither %	Slightly Disagree %	Strongly Disagree %
I am less concerned about the risk of fire than about other risks to personal safety (N=150)	14.7•	36.7•	18.7•	14.7•	15.3•
I moved here to be close to nature (N=156)	46.1	38.5	10.3	1.9	3.2
I think about the risk of fire here everyday (N=156)	1.9	19.9	16.7	22.4	39.1
The impact of fire is far greater than of any other risk (N=155)	30.3	25.8	12.9	22.0	9.0
The bush should be left as untouched as possible (N=155)	36.8	24.5	5.2	24.5	9.0
I haven't really thought about fire risks (N=147)	1.3	11.6	8.2	23.1	55.8

A majority of respondents (62%) disagreed with the statement "I think about the risk of fire here everyday" (Table 1). This appears to relate to the balancing of risk with the benefits of living close to nature. Many respondents indicated that, while aware of the risk, they thought more about their surrounding environment, one respondent commented "Live surrounded by remnant rainforest - beautiful and peaceful environment". Community groups also indicated that the "main priority of those on top of the escarpment is view". Some survey respondents commented that there are other risks and issues that they think about more frequently than bushfire, for example one respondent explained "Fire is a risk concern, though other concerns outweigh fire". Other concerns included personal, family and health matters, and home and environmental matters. Finally, other respondents commented that there is not a high risk of bushfire where they live, for example in a residential street, and they therefore did not think about bushfire everyday. Respondents stating that they did not think about the risk of fire everyday also tended to be less concerned about the risk of fire than about other risks to personal safety (2= 22.432, d.f.= 4, P= 0.01). Such infrequent thoughts about bushfire may reflect fire service perceptions that their community, whether they are aware of the bushfire hazard or not, tend to not think about the risks associated with bushfire until a bushfire arrives.

Roles and responsibility

Fire services were concerned that their community is confused about the roles of urban and rural fire brigades. A fire service member commented that "people do not understand about two brigades on the mountain, often think all RFB… often people do not

know the difference between the red and yellow trucks – they just expect a fire truck to come immediately… different response as Auxiliary red trucks are not supposed to go off road and RFB go off road".
The community groups interviewed demonstrated a good understanding of fire brigades in the area: "[There are] urban paid volunteers and RFB unpaid volunteers. They assist each other. RFB can go off road. RFB in cost squeeze as funds depend on number of properties. RFB also responsible for national parks but receive no funding for this. People are dependent on RFB as the only brigade with off road vehicles. RFB lack of funding and manpower are serious issues".
The survey data could not confirm wider community knowledge of Tamborine Mountain fire brigades. Responses concerning who they would obtain advice from in relation to bushfire safety measures clearly indicated wide recognition of a local brigade servicing the area. However, few respondents specified the RFB, rather referring to the "fire brigade" or the "local rural fire service", for example. Furthermore, the AFB (Auxiliary Fire Brigade) was not selected by any respondents despite their service to a majority of houses in Tamborine Mountain and active role in bushfire safety. This indicates a potential lack of distinction between the two brigades within the community, however additional data is required for confirmation.

Fire services personnel were also concerned about community expectations of fire brigades. Comments included: "many people do not realise that… 000 will not necessarily bring a brigade to their property" and "[people] just expect a fire truck to come immediately".
The community survey specifically asked respondents to agree or disagree with the statement: "if fire were to arrive, we would just call the fire brigade". Responses were divided: 47% agreed and 49% disagreed (Table 2). The data suggests that those who disagreed may be better prepared for bushfire, and perhaps less dependent; 44% of respondents stated that they had a bushfire plan, and this was significantly associated with disagreement about calling the fire brigade if fire were to arrive ($2 = 7.057$, d.f.= 2, $P = 0.02$). Those who agreed tended to lack confidence in bushfire safety, for example agreement was significantly associated with a lack of confidence in having the equipment needed to deal with fire and a lack of confidence with first aid ($2 = 8.149$, d.f.= 2, $P = 0.01$ and $2 = 5.837$, d.f.= 2, $P = 0.05$). Calling the fire brigade if fire arrived was also significantly associated with agreement that there is little you can do to protect yourself and your home against bushfire (Table 2) ($2 = 9.171$, d.f.= 4, $P = 0.05$).

Table 2: Respondent agreeement with statements about protection from bushfire

Perceptions of fire risk	Strongly Agree %	Slightly Agree %	Neither %	Slightly Disagree %	Strongly Disagree %
There is very little you can do to protect yourself and your home against bushfire (N=149)	1.3	6.7	2.7	17.5	71.8
Protecting my home properly is too expensive (N=147)	1.4	7.5	12.2	25.2	53.7
There is no point in me protecting my property if my neighbours don't (N=151)	3.3	7.3	4.6	19.2	65.6
If fire were to arrive, we would leave rather than try to protect our property (N=135)	18.5	18.5	3.0	24.4	35.6
Survival is more about instinct than planning (N=145)	9.7	12.4	4.8	28.3	44.8
There is no point protecting my property if council/other agencies don't clear foliage/ back burn (N=151)	13.9	13.9	2.7	22.5	47.0
If fire were to arrive, we would just call the fire brigade (N=146)	26.7	20.6	4.1	21.9	26.7

It was mentioned by fire services that high expectations of brigade services may be the result of a lack of personal responsibility for fire safety within the community. One brigade member explained that "many people do not realise that they are responsible for their property", and they consequently rely too heavily on fire services. The survey data revealed that respondents who view the householder as less responsible for keeping homes safe from bushfire than others (e.g. QFRS or council) were more likely to agree that they would just call the fire brigade if a bushfire arrived (2= 8.705, d.f.= 2, P= 0.01). This was similar for respondents who viewed their neighbours as more responsible (2= 11.077, d.f.= 2, P= 0.01), and who agreed that there is no point in protecting their property if council/other agencies don't clear foliage and back burn (2= 9.7834, d.f.= 4, P= 0.05) (Table 2). However, according to the survey, a majority of respondents selected the individual householder as most responsible for keeping homes safe from bushfires (Figure 2). Most survey respondents also indicated that they undertook a number of bushfire preparation activities, although the most common activities undertaken relate to general housekeeping, and bushfire specific activities may be neglected (Table 3). According to Table 2, most respondents also believed that there is something they can do to protect themselves and their home against bushfire, that protecting their homes is not too expensive, that survival is about planning, and that it is worth protecting their homes even if others do not. Furthermore, a majority of respondents (60%) indicated that they would try to protect their property rather than leave (Table 2). However, intentions to stay and defend the home was not significantly associated with having a bushfire plan, and intentions to evacuate was not significantly associated with the preparation of an evacuation plan. It seems that people think they are prepared, and think that they have adequate plans in place. Therefore, although the fire services can see that people are inadequately prepared, it is not necessarily for lack of concern.

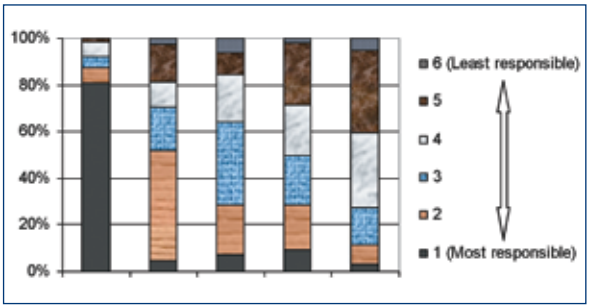

Figure 2. Respondent views on who is responsible for keeping homes safe from bushfire.

Table 3: Bushfire preparation activities undertaken by respondents

Bushfire preparation activities	Action taken (%)
Cut the grass	99
Removed overhanging branches	96
Ensured flammable items and fuel are safe	96
Cleared junk out of the yard	95
Cleaned out the gutters	95
Checked sources of water and hoses	93
Installed smoke alarms	83
Checked smoke alarms	82
Checked equipment	56
Purchased fire extinguisher or blanket	48
Established fire breaks or buffers	42
Brushed up on First Aid knowledge	39
Formulated an evacuation plan	37
Talked to the neighbours about fire safety	27
Decided on situations to stay or go	26
Contacted Council about clearing vegetation	21
Established a local warning system	8
Installed sprinkler system (internal/external)	8
Contacted the Fire Service for Safe Home visit	5

Bushfire hazard management

There was general agreement among fire services and the community that firebreaks are an important bushfire management strategy. Fire services did not identify any issues within the community concerning firebreaks. Community groups interviewed voiced their support: "fire trails have made a [positive] difference", and explained that a "local fire management strategy developed 120 kilometres of fire trails". The survey revealed that 75% of respondents believed that firebreaks are an essential part of bushfire prevention. Controlled burning however, was a more controversial management strategy according to fire services: "the public's response to hazard reduction [controlled burning] is that they don't want it"; "a majority of people do not want hazard reduction [controlled burning] because of negative effects"; and "some people have been lobbying for no-burn". The survey suggested opposing community views, 89% of respondents believed that controlled burning is an essential part of bushfire prevention, and a minority believed there were negative effects (Figure 3). Interviews with community groups revealed that controlled burning can be a complex

issue; while there is general support for controlled burning, some residents are concerned about maintaining the biodiversity values in the area. One community member commented: "regular controlled burning can favour certain species so there is a need for irregular burning as there are 14 different ecological systems".

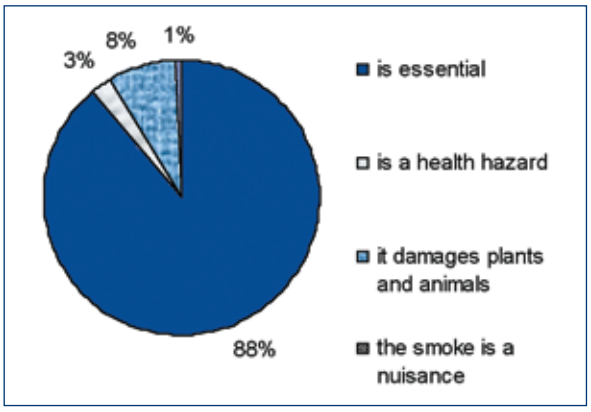

Figure 3. Respondent views on controlled burning.

Discussion

There were both similarities and differences in perceptions of community fire issues between fire services and the community. The data suggests that fire services recognise issues within the community, however clarification of these issues may be required. For example, in regard to risk perceptions, fire services identified the environment as an emotive issue for many people in the community, and this was confirmed through interviews with community groups and the community survey. However, fire services linked this with a lack of awareness of the bushfire hazard, which was not supported by the survey data; most respondents indicated that they were in fact aware. Despite this professed awareness, respondents explained that there are often other issues that take priority over the bushfire hazard; the objective bushfire risk has been mediated through social and cultural processes. It is important for fire services to understand these processes in order to deliver education strategies that better compliment people's lives rather than compete.

In terms of roles and responsibilities, fire services suggested that community expectations of brigades may not reflect the actual situation. As a result there can be a heavy reliance on brigades, particularly during a bushfire event, which is dangerous because brigades may not be able to assist all households in need because of limited resources. The survey data highlighted a segment of the community which may rely too heavily on brigades in the event of a bushfire. These respondents tended to be under-prepared and lacked confidence in undertaking bushfire safety measures, they also viewed themselves as less responsible for keeping homes safe from bushfire than others. A majority of respondents however, appeared to be relatively independent, they viewed themselves as most responsible for bushfire safety and believed that they can protect themselves and their home against bushfire, for example. However, given that household preparations tended to neglect a number of bushfire specific activities, including developing a bushfire action plan or evacuation plan, residents may in fact rely more heavily on fire services in the event of a fire than they stated in the survey. This suggests that many residents may actually underestimate the bushfire event and associated risks, and overestimate their ability to cope with bushfire.

This case study clearly highlighted the similarities and differences between fire service and community perceptions regarding views on bushfire management strategies. The local Bushfire Management Plan, developed as part of the Tamborine Mountain Escarpment Management Plan (Watson, 2001), which was initiated by the community and developed in consultation with the community, specified the development and maintenance of 120 kilometres of firebreaks. Such community involvement and support provides fire services with an objective measure of community views. The Plan also outlined the undertaking of controlled burning, which should also indicate community support. However, fire services have noted a negative public response, which may have emanated from some environmental groups, and which may have lead to fire service perceptions that the community does not support controlled burning. The community survey indicates strong community support, and suggests that opposition to controlled burning is being voiced by a minority group. However, this minority group may be a well-informed one and should not necessarily be ignored.

Key implications

A major issue for fire services is one of how to gain attention when other issues take priority for the community. In addition, there is a need to approach preparedness issues in a multifaceted way. At Tamborine Mountain, there does appear to be a substantial section of the community which is not at all prepared. Conversely, there is a substantial group of people who think they are responsible for their safety, but are nonetheless not sufficiently prepared. The different groups will require different community education approaches. This is complicated by the fact that they are not a discrete, easily identifiable group. Of particular concern is the lack of evacuation planning that is evident. However, the Tamborine Mountain case study indicates that communities should not be viewed as a 'problem'. The fact that there was substantial community involvement in the preparation of an environmental management plan which included fire issues indicates that the community should also be viewed as a resource for fire services.

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