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## Welcome from Editors

It is our pleasure to bring to you the compiled papers from the Research Forum of the AFAC and Bushfire CRC Annual Conference, held in the Perth Exhibition and Convention Centre on the 28<sup>th</sup> of August 2012.

These papers were anonymously referred. We would like to express our gratitude to all the referees who agreed to take on this task diligently. We would also like to extend our gratitude to all those involved in the organising, and conducting of the Research Forum.

The range of papers spans many different disciplines, and really reflects the breadth of the work being undertaken, The Research Forum focuses on the delivery of research findings for emergency management personnel who need to use this knowledge for their daily work.

Not all papers presented are included in these proceedings as some authors opted to not supply full papers. However these proceedings cover the broad spectrum of work shared during this important event.

The full presentations from the Research Forum and the posters from the Bushfire CRC are available on the Bushfire CRC website [www.bushfirecrc.com](http://www.bushfirecrc.com).

**Richard Thornton and Lyndsey Wright**

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### **Disclaimer:**

The content of the papers are entirely the views of the authors and do not necessarily reflect the views of the Bushfire CRC or AFAC, their Boards or partners.

# **Couples' bushfire survival planning: a case study**

## **The 2011 Lake Clifton (WA) Fire**

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### **Abstract**

Evidence from several sources indicates that during the 2009 Victorian bushfires (Black Saturday), many couples did not have a bushfire plan, others failed to execute their plans and some members of couples perished. Whilst there were many cases of successful couple decision-making, there were also apparent failures of survival-related couple decision-making. In this study, transcripts of 29 interviews with members of different households conducted following the Lake Clifton bushfire (WA, 10 January 2011) were analysed to examine couples' long term bushfire planning and preparation. Findings indicate mostly moderate levels of concern by couples about bushfire risk. Long-term preparation was mostly focused narrowly on protection of the house, with less attention given to the likely needs of children, pets, important records, and other valuables. Husbands mainly managed home protection bushfire preparation. The majority of those interviewed said that if they were threatened by a bushfire in the future, they would act in the same way as they had on the day of the fire.

## Introduction and Overview

In potentially hazardous threat situations such as bushfires, threatened householders undertake one of three survival actions: (a) evacuate the area before the fire threat is obvious; (b) stay and defend a suitably prepared property; or (c) flee once the threat is imminent. Historically, this last alternative has been found to be the most hazardous (Haynes, Tibbits, Coates, Ganewatta, Handmer, & McAneney, 2008). A plan, either to stay and defend the property or to leave early, requires careful thought and preparation having regard for a household's particular circumstances. However, a common feature of those affected by the Victorian fires of 7 February 2009 was a lack of planning and preparation to either to stay and defend or to leave safely (Handmer, O'Neil, & Killalea, 2010). It seems clear that in order to minimize loss of life in future catastrophic bushfires, there is an urgent need to examine and address the apparent general lack of bushfire survival planning by households in bushfire-prone locations.

The present study reports findings from interviews conducted by a Bushfire Cooperative Research Centre team with householders who were impacted by the bushfire which destroyed 10 homes in the rural community of Lake Clifton (WA) on 10 January 2011. The original field-research investigation is described in McLennan, Dunlop, Kelly and Elliott (2011). Transcripts of the interviews with 40 residents were examined, 29 transcripts were selected for analysis because the households comprised couples. These transcripts were analysed so as to identify couple-related issues concerning planning for bushfire threats.

## Background

Systematic research contributing to a better understanding of the psychological processes involved in householder decision making related to bushfires is scarce (McLennan, Elliott, & Omodei, 2012), particularly research focused on marital or couple dynamics related to bushfire survival. The literature concerning bushfire survival-related decision making has largely focussed on individuals (e.g., Martin, Bender, & Raish, 2007). A notable exception was the research conducted by Proudley (2008) where the influence of family dynamics on family bushfire-safety related decisions was identified. Proudley concluded that the roles adopted within family units strongly influenced householders' behaviours during a bushfire threat; and that women and men differed in their intentions and actions, with women taking children to safety, and men more likely to engage in fire fighting activities.

Improved community bushfire safety will only be achieved through better understanding of how members of households in at-risk communities understand their situation in relation to bushfire (Collins, 2008). The present study extended previous (limited) research on how householders think about bushfire risk by focussing on how a sample of couples responded to a bushfire which destroyed homes and threatened lives in their community. Here, the term 'couples' refers to two persons who are unified by marriage or in a de facto relationship and who are usually resident in the same household (Australian Institute of Family Studies, 2011).

## **Aim**

The study was exploratory. The aim was to identify issues and processes involved in couples bushfire planning and preparation which emerged in the course of interviews with householders affected by the bushfire which impacted the small community (about 60 households) of Lake Clifton (100 kilometres south of Perth) on Monday 10 January 2011. The purpose was to inform development of a larger and more comprehensive future research program which will investigate important factors involved in how couples plan for bushfire survival.

## **Method**

### **Participants and data sources**

As indicated previously, the study involved analyses of transcripts of interviews conducted by Bushfire Research CRC research teams following the Lake Clifton (WA) bushfire of 10 January 2011. In total, 40 interviews had been conducted. Eleven interviews were excluded from the present study because these interviews did not include any reference to a couple. Thus the total number of transcripts considered in the present study was 29. While the unit of analysis was the resident couple, in seven interviews the informant was the husband, in fourteen it was the wife, and in eight both members of the couple participated.

### **Procedure**

A content analysis, which relates to "...a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p.1278), was used to identify categories and themes relating to the issues listed below.

Each interview transcript was examined in relation to six variables:

Couples' bushfire risk perception and risk awareness.

Couples' long term bushfire planning and preparation.

Couples' relationship.

Gender differences in approach to bushfires.

What couples did on the day of the fire.

Couples' future bushfire plans.

### **Data analysis**

In order to facilitate the analysis, statements in the transcripts were categorized. A Coding Form for the interviews transcripts was developed. The coding form enabled information to be extracted from the interview transcripts about factors such as couples' awareness of the bushfire risk for the area; gender differences in bushfire risk perception; knowledge of fire

(what to do before and when a bushfire threatens), previous experience with fires, and implementation of the household bushfire plan—if any. Additionally, Rating Scales were developed to facilitate the estimation of the comprehensiveness of a plan, the degree of detail, and the amount of couple consensus regarding the household bushfire plan. A copy of the Coding Form and the Rating Scales is in the Appendix.

## Results

The findings from content analysis are presented below in relation to each six major couple-related bushfire issues.

### Couples' bushfire risk perception and risk awareness

Findings showed a generally high level of awareness about the possibility of a bushfire. However, 33% of the couples described a level of concern only ranging from very low to moderate: *"You don't sort of really worry about it"*; and *"You never think it's going to happen to you"*.

This suggests that some couples find it difficult to envisage that a specific risky event represents a serious potential threat due to an under-estimation of their level of the risk (Caponecchia, 2012; Weinstein, 1987). Previous research suggests that such underestimations may result in reduced motivation and willingness to adopt effective natural hazard threat mitigation behaviours (Farace, Kenneth, & Rogers, 1972; Jan, George, & Linda, 2011). In this way, couples' effective long-term bushfire planning and preparation may be compromised.

### Couples' long-term bushfire planning and preparation

The present study found a general lack of couples' long-term bushfire planning: 21 couples did not have a formal bushfire plan; and for those who had a plan ( $n = 8$ ), it usually consisted of *"a fair bit of talking"* (without plans for action), mainly discussion about the most important things to do and what to take on leaving. The most frequently reported intention was not to stay at home if a bushfire threatened (*"we always said we'd just leave anyway"*).

The findings also highlight some specific characteristics of the long-term planning and preparation made by those couples who prepared for a bushfire threat. Long-term preparation was mostly focused narrowly on the protection of the house. This included: sprinkler systems; petrol pump and water tank systems; keeping the area clear of native vegetation; fire hoses; and in some cases generators. Little or no attention was given to the likely needs of children and pets, or the safety of important records and other valuables. As a result, most couples evidenced a generally low level of comprehensiveness in their long term planning and preparation. That is, their intended actions focused on one aspect rather than on a broad range of aspects. As a couple stated, *"Never mind the rest of - never mind the insurance and the passports and all the photographs, the dog is the main "*. Attention to detail, that is who does what before, during, and after a bushfire, was mostly not specified.

There was only one case of very detailed long-term planning and preparation for an active defense of the house. This couple was very aware of their vulnerability and remained

convinced that without their detailed planning and preparation the house would have been lost. Their primary plan was active defence, but they had a backup plan to leave if defence was impractical. Thus, they had two simultaneous preparation activities: (1) packing for them to go, in the worst case scenario; and (2) getting blankets, towels, water containers, and hoses ready for defending. The long-term plan had been carefully thought through, and the couple went through it again after the event to identify flaws: *"Two things in our plan that we'd overlooked, that was having batteries in the radio [...] and a recharging plug in the car for the mobiles"*. On the day of the fire, their defence plan was fully implemented and the house was saved.

## Couples' relationship

'Couples relationship' refers here to: their level of engagement, initiatives, power and consensus in planning for bushfire threats. Practical actions and initiatives related to the preparation of the property (yard and house) were mostly managed by the husband. This was especially so in the case of the couple described above. Both in regard to planning and actions on the day, the husband was in charge of the preparation and his style appeared to be very directive. He took all the initiatives; organized task divisions; and gave orders: *"The only time I [the husband] panicked was I told S\_\_\_\_\_ to not go down into the smoke and she disappeared down there and I didn't see her come back into the house so I went mad at her for a while about that because you know you've got to obey the chief"*. Nonetheless, the couple presented a high level of agreement and solidarity to the interviewers (J. McLennan, personal communication).

Among most other couples interviewed, there appeared to have been a generally tacit process of no formal planning, but a shared intention to simply leave the property if a fire threatened: *"I don't think we ever dreamed for a moment that we would stay here when the fire was coming right over the top of us"*. It may be that when the level of risk is perceived as minimal, decisions are less likely to be the result of joint decision-making processes (Sheth, 2011).

## Gender differences in household bushfire

Differences in preferred actions along gender lines have been found previously in couples' actions under bushfire threat, with men preferring to stay and women wanting to leave and take the children to safety (Handmer *et al.*, 2010; Proudley, 2008). This suggests the operation of unwritten household rules (Sholevar, 2003) about bushfire-safety based on gender expectations, which are likely to influence couples decisions about bushfire plans and safety. The analyses of the interviews following the Lake Clifton bushfire found that household bushfire house and yard preparation was mainly managed by husbands. Wives generally focused on taking paperwork and other relevant important documents such as insurance papers, birth certificates, passports, and photos.

## On the day actions: from "WAIT AND SEE" to "WENT TO SEE"

In their review of fatalities prepared for the Victorian Bushfires Royal Commission by Handmer, O'Neil, and Killalea (2010) described evidence of procrastination by many of those

who perished. Almost 30% of fatalities were 'waiting and seeing' before making a final decision to stay and defend their property or leave. Some couples affected by the Lake Clifton fire exhibited a very different pattern of behavior in which one member of the couple drove toward the fire to see where the fire was and what was happening, with the partner remaining at home waiting for his or her return. As a result, many became couples separated when the fire front arrived. Due to a lack of prior discussion among family members about the possibility of having to face the disaster separated from one another some were, in hindsight, critical of their action, as they regretted leaving their partner alone. As a wife commented: *"that was an okay decision. But as far as splitting the family, that didn't always sit well. But it was like, stay as long as it's safe but we're not going to -- I will keep the kids safe"*.

## Couples' bushfire plans for the future

One of the questions asked during the interviews was about thinking of possible actions in case of a future bushfire threat. The majority of those interviewed said that if they were threatened by a bushfire in the future, they would act in the same way as they had on the day of the fire. A frequent comment was that there would not be anything they could really do as they already had firebreaks and sprinklers. What seemed to emerge was a general lack of knowledge about specific actions to undertake under bushfire threat. However, some of the couples interviewed said they would "*probably*" do some things different. Below are some examples:

*Switching the electricity off and packing more valuables.*

*"... basically start the pumps and got the sprinklers going around the property"*.

*"... probably would have collected up the chooks and birds, as [...] discussed"*.

Would have liked to remove more trees that it was allowed to, to feel safer. Also, have had their neighbours' phone numbers.

Would have waited much further from the place affected by the flames. An interviewee said to her husband: *"You should never have sent us there. Because that was worse for her [the daughter], the one who'd just left, to sit there and watch; knowing"*.

*"I'm going to get a box up, and I'm going to put the box there and I'm going to put all these relevant papers in, they're really material things that..."*

*"Probably clothing"*.

The wife would want to stay, with the kids as well. *"[...] So the kids will be older so they'll be able to help out a bit". [...] But if it's a howling wind and it's moving, you'd probably just say, no. Got to go"*.

Would probably be more organized in terms of having things ready to go, such as a permanent ready-to-go kit packed.



Would like to take the phone charger, the wedding album and would think about their pets (a fish and chooks).

Would have grabbed more papers.

Comments such as these suggest that community bushfire safety educational material provided by the fire agency had not been studied carefully by residents prior to the fire of 10 January 2011.

## Limitations

Due to the nature of the data gathering, there have to be acknowledged inherent limitations of the study. The interviews were not specifically designed to investigate couples' joint planning and preparation for bushfires. Consequently, much specific information on the about the couples was missing or be incomplete, including length of the relationship, gender stereotypes, family decision making styles, and styles of relating. A more focused and comprehensive study involving couples residing in at-bushfire risk locations will be designed and will take into consideration couples' relationship dynamics and other processes which may determine how couples approach household bushfire safety.

## Conclusions

The study explored six major areas concerning couple-related bushfire matters. Consistent with what Proudley (2008) noted, family dynamics and particularly the roles exercised within the family unit affected couples' behaviours during the bushfire. Household bushfire preparation of those couples affected by the Lake Clifton fire (2011) was mainly managed by husbands, while wives generally focused on taking relevant important documents. Gender expectations had established unwritten household rules which influenced bushfire-safety planning decisions and behaviours. Couples often focused narrowly on the protection of the house, and gave less attention to the likely needs of children, pets, and valuables. Above all, couples tended to under-estimate the level of their risk. Remarkably, while the majority of those interviewed said that if they were threatened by a bushfire in the future they would act in the same way as they had on the day of the fire, they also identified numerous specific actions they wished they had taken. This implies a lack of knowledge about the specific actions likely to enhance survival if threatened by a bushfire threat. Notwithstanding the considerable effort spent every year by Australian fire agencies in making available information to residents in fire-prone areas about bushfire safety plans and preparation, the study found that levels of household planning and preparation were generally low. It is thus more important than ever to better understand couple (or family) relational processes in relation to bushfire threat. Further research planned will involve surveys of, and interviews with, couples residing in at-bushfire risk locations about their perceptions of bushfire risk and plans and preparations to survive bushfires so as to improve our understanding of how to promote community bushfire safety at the couple level.

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**Appendix- Coding Form and Rating Scale**

<i>CODING FORM – Couple decision making</i>				
Interview n. _____				
<i>Fire event</i>	<i>Lake Clifton</i>	<i>Black Saturday</i>	<i>Perth Hills</i>	
<i>Family structure</i>	<i>Unknown</i>	<i>Only the spousal dyad</i>	<i>The spousal dyad with children</i>	<i>The spousal dyad with other family members</i>
<i>Children age (if any)</i>	<i>Unknown</i>	<i>Under 16</i>	<i>Adult children</i>	<i>No children living with the couple</i>

<b>COUPLE AWARENESS OF FIRE PRONE AREA</b>				
Unknown	1. Nil	2. Minimal	3. Some	4. High
<b>GENDERED DIFFERENCES IN RISK PERCEPTION</b>				
Unknown	1. Nil	2. Minimal	3. Some	4. High
<b>KNOWLEDGE OF FIRE (what to do before and when the fire approaches)</b>				
Unknown	1. Nil	2. Minimal	3. Some	4. High
<b>PREVIOUS EXPERIENCE WITH FIRES</b>				
Unknown	1. Nil	2. Minimal	3. Some	4. Several
<b>LONG TERM BUSHFIRE PLAN</b>				
Nil	1. Minimal	3. Discussed in general terms	4. Very detailed	
<b>JOINT PLANNING</b>				
Unknown	1. Nil	2. Minimal	3. Some	4. High
<b>MAIN INTENDED ACTION</b>				
Stay and defend	1. Leave early	2. Wait and see	3. Other	
<b>DEGREE OF COUPLE CONSENSUS</b>				
0. Unknown	1. Nil	2. Minimal	3. Some	4. High
<b>TASKS DIVISION BY GENDER</b>				
Unknown	1. Nil	2. Minimal	3. Some	4. High
<b>BEHAVIORS/INTENDED ACTIONS THAT SOUGHT TO BENEFIT THE COUPLE AS A WHOLE</b>				

Unknown	1. Nil	2. Minimal	3. Some	4. High	
<b>IMPLEMENTATION OF THE PLAN</b>					
Unknown	1. Not implemented	2. Minimal	3. Some implementation	4. Fully implemented	5. Done something else

## Long term planning Scale

SCALE LEVEL	COMPREHENSIVENESS	DEGREE OF DETAILS	AMOUNT OF COUPLE CONSENSUS
Level 4 High	<p>Very comprehensive plan either about leaving or staying and defend well – prepared properties.</p> <p>Intended actions are focused on a broad range of aspects, such as the property, people, vehicles, pets, valuables, etc.</p> <p>The personal ability to mentally and emotionally cope with the event, as well as the physical preparedness, is taken into consideration.</p>	<p>Highly detailed and written plan either about to leave or to stay and defend the property. Who does what before, during, and after a bushfire is meticulously thought.</p> <p>This may include:</p> <ul style="list-style-type: none"> <li>Home preparation</li> <li>Arrangement of transports</li> <li>Consideration of a number of travel routes to avoid risky areas</li> <li>All persons with special needs are considered and accommodated</li> <li>Important items (such as insurance policies, family photos and valuables)</li> <li>Emergency kit</li> <li>Development of a list of items couple/family will need, and prepare a relocation kit.</li> <li>OR:</li> <li>Clearness of defendable spaces and undergrowth</li> </ul>	<p>Partners agree with the all intended actions, tasks distribution and timing, either about leaving or staying and defend.</p>

		<p>Checking of resources and equipment to effectively fight a fire (sprinkles, pumps, hoses, strong buckets, water supply, etc.)</p> <p>Arrangement of safe refuge locations</p> <p>Basic equipment and clothing.</p>	
Level 3 Some	Some approximate arrangement on different aspects.	<p>Intended actions are discussed at some level and a broad list of general 'things to do' may be included.</p> <p>There may be present a quite detailed arrangement consistent with usual roles.</p>	<p>The couple appears in agreement with several aspects of the plan/intended actions. Nonetheless, some divergences characterize couple consensus at this level.</p>
Level 2 Minimal	The level of comprehensiveness is minimal. The plan (or intended action) is mainly focused on one aspect, with all the rest barely mentioned.	<p>Abstract ideas in broad terms. These may be hypotheses about potential actions of leaving or stay and defend or wait and see, discussed at a minimal level.</p> <p>A potential tasks distribution is outlined.</p>	<p>The amount of consensus is low.</p> <p>Partners may agree of general aspects such as safety issues. However, they may intend safety is different way: for instance, sheltering or fleeing.</p> <p>Conflicts may arise.</p>
Level 1 Nil	Focus on one aspect or the other. The plan appears vague and unclear.	No details are present. Who does what before, during, and after a bushfire is unmentioned.	<p>Strong disagreement between partners.</p> <p>Actions are individually thought and undisclosed.</p>
Level 0 Unsure or N/A	No plan	No plan	No plan