



**Program: Communication Risk**  
**Project: Human Behaviour Under Stress (2)**  
***Staying Safe Before, During, and After a Bushfire***

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## Overview

**Task:** Analyse the 600+ transcripts of interviews conducted by the Bushfire CRC Research Task Force with survivors of the Victorian 2009 'Black Saturday' bushfires

**Expected Outcome:** Fire and emergency services agencies are better informed about how residents make safety-related decisions under the stress of bushfire threat



# 7<sup>th</sup> February 2009: Black Saturday





## 7 February 2009 "Black Saturday": 173 deaths





Evidence from—

(a) the 2009 Victorian Bushfires Royal Commission; and

(b) preliminary indications from the Bushfire CRC Research Taskforce

--suggested that a significant number of these deaths need not have occurred if the adults involved had made decisions more appropriate to their situation, in the face of imminent threat from fire.



## Goal & Aim of the project

1. The goal of the project is to reduce the probability of people perishing despite the imminent threat of being impacted by a severe bushfire.
2. The aim of the project is to identify the critical psychological factors involved in survival-related decision making by civilians under imminent threat from a bushfire.



## Reference Group:

- End-user Leader: Damien Killilea, TFS.

### Members

- Gwynne Brennan, CFA
- Fiona Dunstan, SA CFS
- Gary Lockyer, NZ Fire
- Tanya Tuckey, NSW RFS



## Procedure

1. Use a categorising, coding, and rating scheme to extract information from the transcripts. Necessary because of the variability in the interviews—structure, format, and quality.
2. Use the Nvivo text management software tool to sort interview statements into categories for content analysis.
3. Two independent codes/raters for each interview, compare subsequently, resolve disagreements by: re-examining the text, discussion, and consensus (and on rare occasions by a coin-toss!).  
---EXTREMELY time consuming!





## Illustrative Findings for the Murrindindi Fire: Intentions, Actions, Expectations, Outcomes

1. 49 transcripts
2. **Intentions:**
  - 28 to stay & defend
  - 14 to leave safely
  - 1 to wait and see
  - 6 had no plan
3. **Actions:**
  - 21 stayed and defended
  - 21 left before the fire arrived
  - 7 absent on the day (2 by choice, 5 by chance)



## 4. Expectations

14 of the 42 said that they expected an official warning to help decide what to do.

Of the 21 who stayed & defended, 6 expected an official warning, while 10 said they did not expect any such.

Of the 21 who left, 8 expected an official warning, while none said they did not expect an official warning.



## 5. Intentions/Actions

28 intended to stay & defend: 18 did so; 7 changed their mind; 3 not at home-chance.

14 intended not to be present: 4 absent on the day-2 by chance & 2 by choice; 9 left; 1 attempted to defend—unsuccessful.

Overall; of the 35 residents present on the day who had a plan, 27 (77%) implemented their plan.



## 6. Outcomes

21 stayed and defended: 14 succeeded;

7 failed—5 fled in vehicles (2 relatively safely, 3 sheltered in their vehicles on open ground), 2 escaped on foot and took last-resort shelter on or near their house.

21 left (all in vehicles): 17 safely, 4 encountered danger.



## Staying & Defending *versus* Leaving

Stayed and Defended:

1. Higher levels of property preparation.
2. Higher levels of readiness on the day.
3. Higher levels of awareness of fire danger weather.
4. NO differences on (i) awareness of threat of the approaching fire; or (ii) general knowledge/experience of bushfires



## Defending Successfully *versus* Failing

1. NO Differences on: property preparation; readiness on the day; awareness of fire danger weather; awareness of approaching fire; knowledge/experience.
2. MORE likely to describe: building vulnerability (construction and/or adjacent fuel); water supply equipment failure



## Deciding to Stay & Defend or to Leave(1)

### 1. Stay and Defend:

- Prior commitment to the plan to stay & defend.
- (not safe to leave, anyway).

### 2. Leave:

- Perceived fire severity: advice—official & unofficial; sight of flames, smoke, embers, others leaving.
- Information about the fire location and direction of travel.



## Deciding to Stay & Defend or to Leave(2)

1. Stayed and defended: 90% said they expected a fire to hit them some day.
2. Left: 57% said that they expected a fire to threaten their property some day.





## Deciding to Stay & Defend or to Leave(3)

Indications of two somewhat independent decision processes:

'staying' factors: prior commitment and preparation; and

'leaving factors': perceived severity of the fire, and certainty that it will hit.

'Uncertainty' was thus a key aspect of leaving-  
Suggesting that agencies need to do more to inform/educate about **how** to 'leave' safely.



## Plan

To have a Report for agencies by end-September 2011, organised in three sections:

1. Overall.
2. Three fire categories: *Rural* (Churchill Fire; Beechworth Fire; Bunyip Fire, most Kilmore East Fire transcripts, a few Murrindindi Fire transcripts); *Rural Town* (most Murrindindi Fire transcripts, remainder of the Kilmore East Fire transcripts); *Urban-Rural Fringe* (Bendigo Fire; Horsham Fire; Narre Warren Fire).
3. Each of the eight fires separately.



## Output-related activities since the project began in September 2010:

1. Oral paper presented at AFAC 2010.
2. Paper on stress and bushfire survival published in *The Australian Journal of Emergency Management*, April 2011.
3. Manuscript submitted to an A-ranked journal in May 2011—deciding to stay and defend or to leave.
4. Oral paper accepted for AFAC 2011.
5. *AFAC Proceedings* paper in preparation—effects of stress on human performance..
6. Analysis of 39 interview transcripts from the Lake Clifton (WA) Fire of 10 January 2011 in progress, for a report 30 June 2011 (with UWA).