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CAPTURING COMMUNITY MEMBERS' BUSHFIRE EXPERIENCES: INTERVIEWS WITH RESIDENTS FOLLOWING THE 12 JANUARY 2014 PARKERVILLE (WA) FIRE

Report for the Department of Fire and Emergency Services Western Australia

Government of **Western Australia**
Department of **Fire & Emergency Services**

DFES
Department of Fire & Emergency Services

Jim McLennan
La Trobe University

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Cover: Firefighters battle the Parkerville bushfire. Photo by the Department of Fire and Emergency Services, Western Australia.

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Bushfire & Natural Hazards CRC Interviewers

Alexandra Boeing

Jessica Green

James Lewis

Jim McLennan

Devon Spaarpen

Caitlin Timms

DFES Community Engagement Staff

Suzanne Blyth

Su Ferreira

Vivienne Gardiner

Tracey Leotta

Lauren McDonnell

Heather McNamara

Rachael Parkes

Jennifer Pidgeon

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EXECUTIVE SUMMARY

1. Sunday 12 January 2014 was a day of Extreme fire danger for much of the Perth Hills. A bushfire broke out in the Mundaring Shire locality of Parkerville at about 1130 hours. Following a previous week of high temperatures, the fire moved rapidly in an easterly, then a north-easterly direction through mostly open woodland and residential areas. During the day, 57 homes were destroyed in Parkerville, Stoneville and Mount Helena.
2. In order to learn from this fire event, Department of Fire and Emergency Services (DFES) senior staff commissioned the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC) to undertake interviews with residents in the affected area.
3. Over a 3-day period (2–4 April), joint BNHCRC–DFES teams conducted interviews with 91 households, most in or near the fire scar. This represents approximately 20% of households in the threatened area.
4. Of the 91 residents interviewed, 42% were male and 58% female; their mean age was 57 years; 38% reported being responsible for vulnerable dependents (young children, elderly or disabled family members); and 78% had pets or livestock to consider. Fifty-three per cent lived on standard-sized residential blocks (~0.1 ha); one property visited was an agribusiness; the remaining residents lived on relatively large life-style blocks, most of which included stands of woodland.
5. The majority of residents described good social connections with neighbours. Eleven per cent reported a previous bushfire threat experience. Twenty-six per cent reported having a family member who was, or had been previously, a fire brigade volunteer.
6. Very few of those interviewed reported having participated in any form of organised community bushfire safety activity.
7. Fifty-six per cent reported being 'quite concerned' about a possible bushfire threat *prior to* the 12 January 2014 fire; 21% reported 'some concern'; 14% reported 'slight concern'; 9% reported 'no concern' about bushfire threat prior to the 12 January fire. Teams estimated that 86% of homes visited were within 100 m of significant stands of vegetation.
8. Almost all those interviewed reported reading some official sources of bushfire safety information. For most (65%), this was the Shire of Mundaring booklet that accompanied annual rate notices. Thirty per cent reported reading the *Prepare. Act. Survive.* booklet. Very few reported using material on the DFES website: the *Homeowners Bush Fire Survival Manual* or the *Am I at Risk of Bushfire?* booklet.
9. Eighty-one per cent described having a bushfire plan prior to the 12 January bushfire: leave – 49%; stay and defend – 14%; some family members stay and defend, others leave – 11%; wait and see how bad the fire is, then decide finally – 7%. Nineteen per cent said that they did not have a bushfire plan. It is noteworthy that only 7 of the 91 interviewees had prepared a written plan (8% overall; 10% of those who *had* a plan).
10. The reasons residents gave for their plan matched those found from previous Bushfire Cooperative Research Centre (CRC) post-bushfire interview research: (a) those who plan to leave do so because of the perceived danger posed by a bushfire, especially if there are vulnerable members of the household such as young children; (b) those who plan to stay and defend do so because (i) they wish to protect a valued asset that they believe would be lost if unattended, and (ii) they are confident of success – most do not see staying and defending as a bushfire *survival* option but rather as an asset protection choice that entails some risk; and (c) those who plan to wait and see choose this because (i) they believe their bushfire risk is low, (ii) they believe that waiting does not add to their risk, (iii) both leaving unnecessarily and having to defend against a severe bushfire are unappealing options, so (iv) they plan to wait and hope for the best that the fire will not impact their property and they will not have to make a choice.
11. There were wide variations in residents' levels of bushfire preparation prior to 12 January 2014, mostly associated with their differing bushfire plans. Those who planned to leave were

not well prepared overall: while 42% had prepared a go-kit of valuables, only 24% had a chosen safe destination; 11% had planned an evacuation route; and only 7% had decided on a trigger for safe evacuation. For those who planned to stay and defend, 69% had both a dedicated firefighting water supply and a power source independent of mains electricity. While most residents reported undertaking easy and inexpensive actions to reduce danger to their home (such as clearing vegetation), very few had undertaken more complex or expensive preparations – such as enclosing vents and spaces or installing a house protection sprinkler system.

12. While almost all commented on the period of hot weather immediately preceding the day of the fire, very few described doing anything special in anticipation of Extreme fire danger predicted for Sunday 12 January 2014. None of those interviewed left early on the basis of fire danger weather predictions.
13. The most frequently reported early indications of the bushfire were environmental cues: sight of smoke, and sounds associated with the bushfire response – water-bombing aircraft and fire truck sirens. Forty per cent reported receiving an Emergency Alert message about the fire as an early indication of a bushfire threat. The DFES website was the source consulted most frequently by residents seeking further information about the threat (39%) following initial indications of a bushfire threat. Ten per cent went to the Shire of Mundaring Facebook page seeking more information about the fire.
14. The major driver of residents' initial decision in response to the fire threat was their pre-fire bushfire plan; the link was very strong for those who decided they would stay and defend (100%), weaker for those who had planned to leave (62%). Thirty-one per cent decided initially that they would wait and see how the threat developed before making a final decision to leave or to stay.
15. Of the 91 residents interviewed, four were not in the area on the day of the fire. A further 25 were in the area but not at home when the fire was reported. Four of these decided it was too dangerous to return and stayed away. Three tried to return but were prevented by police road blocks. Eighteen returned, four then stayed and defended while fourteen left subsequently. No household members re-located to somewhere safer before the fire on the basis of the Extreme fire danger weather predicted for Sunday 12 January 2014.
16. Of the 80 households where members were at home during at least some period of the fire threat, 69% left and 31% stayed. The main reason for their final action was a judgement that their bushfire plan could and should be acted upon.
17. Fifty-two per cent of those who stayed and defended also defended neighbours' homes.
18. Forty-four per cent of those who left reported a specific trigger that they decided was a signal it was time to leave; the most frequently reported triggers were: sight of smoke, Emergency Alert message, sight of flames, and face-to-face advice from neighbours or police, fire or State Emergency Service (SES) personnel.
19. In summary: most residents interviewed reported having some level of concern about bushfire threat before the 12 January fire. Most reported having a bushfire plan; however, few reported having a written plan. Few had undertaken extensive preparations to reduce house vulnerability and few had planned and prepared for leaving safely if threatened. None of those interviewed had left for a safer location on the basis of fire danger weather predictions before the fire was reported. The findings, overall, are similar to those from post-bushfire interviews undertaken by the Bushfire CRC following bushfires that occurred in Tasmania and NSW in January 2013 and in NSW in October 2013.

INTRODUCTION

Overview

On Sunday 12 January 2014, a bushfire destroyed 57 homes across three Perth Hills localities: Parkerville, Stoneville and Mount Helena. Following the fire, Department of Fire and Emergency Services (DFES) senior management requested the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC) to coordinate a post-bushfire interview survey of residents in the bushfire-affected area, in collaboration with DFES Community Engagement staff. The purpose was to assist the DFES to learn as much as possible about residents' prior understandings of bushfire safety and risk, and their experiences during the fires, thus contributing to improved community bushfire safety in the future. Over 3 days (2–4 April 2014), five BNHCRC–DFES interview teams visited properties in and near the fire-scar area, resulting in interviews with 91 households. This report summarises findings from these interviews. Where appropriate, the findings have been compared with those from previous Bushfire CRC post-bushfire interview studies conducted following fires in Victoria (2009), Western Australia (2011); Tasmania (2013) and NSW (2013). A summary of the major findings from these six previous Bushfire CRC post-bushfire interview studies is in an appendix (Appendix F). No attempt has been made to relate the findings to recent inquiries and reviews conducted into Western Australian bushfires, this being beyond the scope of the present study. Some suggestions about future community bushfire safety endeavours are offered for consideration.

The 12 January 2014 Parkerville Fire

This section is based on information provided by the DFES Parkerville Bushfire Review Team (June 2014) and the Western Australian Regional Office of the Bureau of Meteorology (February 2014).

The bushfire threatened properties in three locations within the Shire of Mundaring (Parkerville, Stoneville and Mount Helena) located approximately 30 km east of Perth. The affected area is essentially a broad valley sloping gently upward, mostly west to east. There is a mixture of large properties with stands of open woodland and grasses, and standard residential blocks, most with trees near homes. The dominant large tree species are jarrah and marri. Other significant tree types include Swan River blackbutt and bullich.

The area experienced a notable hot spell in the middle of December 2013. In the days leading up to the fire, the daily maximum temperatures were well above the Lower West Inland District average of 30.6°C. The predicted fire danger rating for Sunday 12 January 2014 was Extreme. There was a Total Fire Ban in place.

The bushfire started on private property on the corner of Johnson and Granite Roads, Parkerville, at about 1130 hours on Sunday 12 January 2014. It was categorised within an Emergency Service Level (ESL) as Category 3 funding, which in the event of a bushfire means a response from Bushfire Brigades and Volunteer Fire and Rescue, and supported by Career Fire and Rescue firefighters and/or SES volunteers depending on the circumstances.

Throughout the incident, the bushfire's growth, intensity and rate of spread were influenced by the available dry fuel, high temperature (42°C), low relative humidity (9%), wind (gusting to 45 km h^{-1}) and the undulating and sometimes steep terrain in the area. The bushfire spread involved an area of 392 ha.

In accordance with DFES mobilising arrangements during the High Threat period (December to April), additional predetermined response arrangements, which include resources from the Shire of Mundaring, DFES and the Department of Parks and Wildlife (DPaW) were in place. These resources included support from firefighting aircraft.

Given the conditions on the day, the Parkerville, Stoneville, Mount Helena bushfire had the potential to destroy or damage many homes as well as infrastructure in the area. The point of origin was

adjacent to trees and grass and once ignition occurred, the fire was driven by the westerly wind across grassland. By the time the first firefighting crews arrived from Parkerville Bushfire Brigades and Kiara Career Fire and Rescue Brigade, the fire had spread and was running and spotting onto a bridle track next to the creek line on Riley Road. Owing to the fuel loads along the creek line, the fire intensity increased rapidly.

For the first 60 to 90 min, a combination of high fuel loads and the fire weather conditions being experienced made the fire difficult to control even though there were significant ground and aerial resources deployed to the fire.

Property losses were first reported at approximately 1215 hours. At one point, following a concerted effort by aircraft, the head of the fire was slowed, but unfortunately with a change in wind direction to the south-west and an increase in the slope topography, the fire's intensity increased and during the next 2 hours, considerable property losses occurred as the fire travelled into Stoneville. Throughout this period, ground crews applied rural–urban interface firefighting strategies effectively on the fast-moving fire, reducing the potential damage to property considerably.

A total of 57 homes were destroyed. The majority of these losses were in Stoneville. Some 400 at-risk homes were saved.

A map showing the bushfire-affected area and households interviewed is in Appendix A.

METHODOLOGY

Interviews

As with similar post-bushfire studies conducted previously by the Bushfire CRC, a semi-structured interview methodology was used. Residents in the bushfire-affected area were approached by two-person interview teams, each comprising a BNHCRC researcher and a DFES Community Engagement staff member, and asked to describe their experiences of the January 2014 bushfire during a semi-structured interview. A semi-structured interview occupies a middle ground between an unstructured interview and a structured interview. In an unstructured interview, all residents are typically asked the same starting question (e.g. "Could you tell me about your experiences during the January 2014 bushfire?"). This approach allows residents to tell their own story in their own way while a researcher follows the account and asks for elaboration of topics raised by the resident. Such an approach is often used when researchers have very limited knowledge of the issues involved. While this provides freedom to residents to describe what they believe to be relevant, such an approach may mean that issues known from previous research to be important (e.g. whether a resident received an SMS alert and at what time) are not addressed because they were not especially salient for a resident at the time of the interview.

By way of contrast, a structured interview comprises a (usually lengthy) set of precisely worded questions constructed to cover the entire range of issues presumed by the researcher to be potentially relevant. In post-bushfire interview studies, a semi-structured interview format is usually preferred because: (i) residents' experiences of a bushfire are likely to vary greatly, thus many structured interview questions are likely to be irrelevant for some residents, resulting in unnecessarily lengthy and perhaps frustrating interview experiences; (ii) structured interview questions may not address adequately specific topics that are very significant for some residents; and (iii) a bushfire threat can result in highly emotionally charged outcomes, and some residents may experience a structured interview as a lengthy 'interrogation' in which their individual circumstances are ignored, possibly generating ill-will toward the research endeavour and parties associated with it.

The semi-structured interview guide used for this study was developed jointly by BNHCRC researchers and DFES Community Engagement staff. It was based on guides used by Bushfire CRC researchers following bushfires in NSW in 2013. The guide comprised a set of broad questions, plus

supplementary prompts, addressing general topics known to be important on the basis of previous research, plus specific issues of particular interest to DFES. A copy of the guide is in Appendix B.

Face-to-face post-bushfire interviews are time-consuming compared with other methodologies (like postal or telephone surveys) and this means that only a small percentage of residents in an area threatened by a disaster-level bushfire can be interviewed in the time period typically available. Semi-structured interviews generate essentially qualitative information (interviewees' accounts of their experiences) from which quantitative summaries can be compiled. There is general agreement among many qualitative researchers that sample sizes above 30 interviews are usually necessary to achieve what researchers call 'saturation' – the point in a series of interviews with members of a particular population (in this case, residents of a community that has been threatened by a particular bushfire event) where no uniquely new information is being elicited by further interviews (Given, 2008). In the present study, based on previous post-bushfire field interview research conducted by Bushfire CRC researchers, it was decided to aim for a sample of at least 50 households to be interviewed.

Prior to the teams commencing the interviews, there was an extensive campaign in the area advertising the research, with advertisement posted by the Shire, stories in local newspapers, and flyers and posters in shops and other locations frequented by residents.

Teams used copies of a DFES fire-scar map to visit locations in and near the fire-scar area. Because of time constraints, teams were not able to visit more distant locations whose residents nonetheless had received warnings of the bushfire threat. Because of limited time and community dislocation, it was not possible to sample households in a systematic way. Thus, the information elicited and the issues described in the report are those provided by the sample of residents interviewed on those days when teams visited a given neighbourhood. It is not possible to quantify the extent to which the accounts were typical of residents' experiences generally. In particular, (a) residents whose homes were destroyed were hardly represented because most no longer resided in the Mundaring area in April 2014 when teams visited; and (b) younger residents who worked were under-represented because they were not at home during business hours when teams called.

Face-to-face interviews were recorded digitally (with the permission of the participants). During the course of each interview, the DFES team member completed an interview content summary checklist (ICSC). These checklists were the main basis of the quantitative summaries in this report. A copy is in Appendix C. Twelve additional interviews were conducted via telephone. These were not recorded. Instead, for each, detailed notes were made and an ICSC was completed. The recorded face-to-face interviews were transcribed by a professional transcription service. Transcripts were analysed for content and themes as both a check of the ICSC data, and as an aid to interpreting their meaning.

De-identified quotations from interview transcripts have been incorporated in the report to describe residents' views and experiences in their own words. The quotations are in italics. The number at the end of each is the transcript reference code.

Field Interview Teams

The six BNHCRC research interviewers met with DFES staff at the DFES Cockburn Headquarters on Monday 31 March for a training session in the morning. The training session covered interview procedures and included: information on participants' rights; details of the principal questions being asked and follow-up probes; interviewer responsibilities and obligations; and health and safety precautions. They were briefed on the fire event by a member of the Parkerville Bushfire Review Team, and taken by bus for a tour of the fire-affected area in the afternoon. In the field, all team members were dressed in identifying apparel as appropriate (BNHCRC *Researcher* tabards, DFES work-shirt and trousers) and all wore name tags or badges.

Materials and Procedure

The affected locations (Parkerville, Stoneville and Mount Helena) include agribusinesses, residences on large life-style blocks, and residences on standard residential blocks (~0.1 ha). The study area encompassed properties directly affected by the fire (within and adjoining the fire scar) and some other locations considered to have been under threat at some time during the event. A base for operations was established at the DFES facility in Leake Street, Belmont. Teams assembled at 0800 hours each morning for tasking, travelled by DFES vehicle to their assigned area, and returned at about 1730 hours each afternoon for debriefing and data collection. Each morning, field teams were tasked to visit homes in designated streets, and provided with detailed maps of the area showing the fire scar, locations of destroyed structures and locations of dwellings. These maps enabled a representative coverage of homes to be visited while ensuring that any residence was approached on only one occasion. On Day 1, teams were in Parkerville and Stoneville, Day 2 mostly in Stoneville, and Day 3 in Stoneville and Mount Helena.

As noted earlier, a semi-structured interview guide was developed by BNHCRC researchers in consultation with DFES Community Engagement staff. The accompanying ICSC was a printed data summary tool covering topics in the same order as the interview guide and was completed during the course of each interview by the DFES member of the interview team while the BNHCRC researcher led the interview. During each interview, the DFES staff member asked questions about specific aspects of DFES community safety information, activities and warnings. Following each interview, answers noted on the ICSC were checked for accuracy and agreed upon by both team members. At the end of the deployment period, the information content from each ICSC was entered into an *Excel* database for quantitative analysis.

In broad outline, during each interview, residents were asked about their:

- awareness of bushfire risk before the 12 January 2014 bushfire
- preparation for and knowledge of bushfire danger before the 12 January 2014 bushfire
- awareness of official and informal warnings generally immediately prior to and during the bushfire event
- responses to warnings
- experiences during the fire event and any impacts on their property.

Prior to going into the field, each team was provided with:

- Participant Information Statements, one to be given to each interviewee
- Consent Forms, one to be signed by each interviewee and retained by the team
- An interview guide
- Copies of the ICSC
- Copies of a householder Help Sheet, which listed contact details for sources of personal help and assistance for residents experiencing difficulties following the fire, to be left with each household
- Copies of an information flyer to be left at properties where householders were absent encouraging residents to contact the BNHCRC research leader on a dedicated mobile telephone number or email address to arrange an interview
- A DFES map of the area, showing the fire scar and locations of properties to be visited during the day by the team
- A digital recorder
- Snacks and water.

In most cases, residents were approached on their properties by a 'cold-call' visit from a team who drove to an assigned location and then approached individual residences on foot. The purpose of the visit was explained and the resident was invited to take part in an interview to describe their experiences during the fire threat in order for a report about the fire from residents' points of view to be prepared for DFES. Before commencing the formal interview, residents were given the Participant Information Statement, which described the aim of the study and assured them that participation was voluntary, and that their individual responses would be confidential and anonymous. Moreover, they were advised that they could terminate the interview at any time if they wished, and could subsequently request their interview not be included in the study. They were then asked to read and sign the Consent Form. At the end of each interview, the householder Help Sheet was left with the resident.

Most participants (79) were interviewed on their properties; however, some (12) were interviewed by telephone. As indicated above, where residents were not on the property when the team visited, an information flyer was left; this stated that a field team had visited and invited the resident to contact the BNHCRC research leader to arrange an interview. When a resident was at home but not able to take part in an interview at that time, an alternative time for a telephone interview was arranged if possible. Based on experience gathered in previous post-bushfire interview studies (which indicated very low levels of willingness to participate on weekends), visits were conducted during Tuesday 2 April to Thursday 4 April 2014, mainly between 0900 and 1700 hours. Overall, 237 properties were visited and 91 interviews were conducted: 4 with Parkerville residents, 71 with Stoneville residents and 16 with Mount Helena residents. The following table summarises the outcomes of property visits, and presents comparative data from post-bushfire interviews following the NSW October 2013 bushfires.

The 91 household interviews represent approximately 20% of households in the Parkerville–Stoneville–Mount Helena threatened area.

Table 1: Summary of property visits, household contacts and interviews

	Parkerville Fire, 12 January 2014	*Comparison: NSW October 2013 fires*
Property apparently not occupied (*a*)	5	39
Residents absent (*b*)	128	200
Face-to-face contacts (*c*)	104	227
Face-to-face interviews (*d*)	79	177
Refusals	25/104 = 24%	50/277 = 22%
Stated reasons for refusals:		
not a convenient time	11 (44%)	23 (46%)
not interested	5 (20%)	5 (10%)
not in the area on the day of the fire	4 (16%)	2 (4%)
illness	2 (8%)	1 (2%)
too distressed about the fire	1 (4%)	3 (6%)
not sufficiently proficient in English	1 (4%)	–
no reason given	1 (4%)	13 (26%)

other	-	3 (6%)
	100%	100%
Telephone interviews (*e*)	12	17
Total interviews (*d* + *e*)	91	194
Face-face interview participation rate (*d*/*c*)	79/104 = 76%	177/227 = 78%
Total property visits (*a* + *b* + *c*)	237	466
Face-to-face contact rate (*c*/(*a* + *b* + *c*))	104/237 = 44%	227/466 = 49%

Residents were home at 44% of the properties visited, and 76% of those residents contacted agreed to be interviewed. The most common reason for non-participation was that it was not a convenient time. These figures are not greatly different from those found during visits by Bushfire CRC interview teams to properties in three areas of NSW affected by bushfires in October 2013 (McLennan, Wright and Birch 2014).

FINDINGS

Note that because of rounding to whole numbers, some percentage columns may not add up to 100% and there may be some discrepancies across tables.

Those Interviewed

The demographic characteristics of those interviewed and their households are shown below.

Table 2: Demographic characteristics of those interviewed (*n* = 91)

Gender	Male	42% (38)
	Female	58% (53)
Age	Mean (median)	57 years (58 years)
	Standard deviation	15.2 years
	Range	19–82 years
Frequency distribution (years)	<20	1%
	20–29	1% *[12%]**
	30–39	11% *[16%]**
	40–49	20% *[25%]**
	50–59	18% *[21%]**
	60–69	25% *[17%]**
	70+	24% *[9%]**
Household members present on 12/01/14	1	10% (9)
	2	42% (38)
	3	11% (10)
	4	20% (18)

	5	12% (11)
	6	4% (4)
	7	1% (1)
Dependents	Children <13 years	31% (28)
	Teenagers 13–17 years	15% (14)
	Elderly	6% (5)
	Disabled	1% (1)
English as a second language		nil
Occupational status	Employed full-time	28% (25)
	Employed part-time	14% (13)
	Home duties	10% (9)
	Unemployed	7% (6)
	Retired	36% (33)
	Other (volunteer, carer)	6% (5)
Pets/livestock to consider		78% (71)

* The [*n*%] figures are the corresponding age-group percentages for Stoneville based on the 2011 census (Australian Bureau of Statistics QuickStats).

The age of those interviewed was higher than that of the residents generally: those <30 are under-represented, those >60 are over-represented. This is undoubtedly due to the interviews being conducted during business hours on weekdays, when most working residents were at their place of employment. Thirty-eight per cent of households had at least one dependent child under 13 or elderly family member to take into account on the day of the fire. Seventy-eight per cent of households had pets or livestock to take into account when the bushfire threatened.

Type of Property and Insurance Cover

Interview teams noted the type of property visited (standard residential block, ~0.1 ha; large life-style-type block; agribusiness). Residents were asked how long they had resided at their current address, if the dwelling was their primary residence, if they owned or rented, and if they believed their house and contents insurance was 'adequate' on the day of the bushfire. The findings are summarised below.

Table 3: Type of property and insurance cover (*n* = 91)

Type of property	Standard residential block, ~0.1 ha	53% (48)
	Large life-style block	46% (42)
	Agribusiness	1% (1)
Length of stay	Mean (median)	15.3 years (13 years)
	Standard deviation	11.6 years
Frequency distribution	<1 year	1% (1) *(cumulative %)*
	1 year	10% (9) *(11%)*

	2–10 years	31% (28) *(42%)*
	11–20 years	27% (25) *(69%)*
	21–30 years	21% (19) *(90%)*
	31+ years	10% (9) *(100%)*
Primary residence		100% (91)
Ownership	Own – no mortgage	45% (41)
	Own – mortgage	53% (48)
	Rent	2% (2)
Insurance on 12/01/14		
House	Adequately insured	92% (84)
	Under-insured	8% (7)
Contents	Adequately insured	82% (75)
	Under-insured	15% (14)
	None	3% (3)
Location of property	Inside or adjacent to the fire scare	57% (52)
	Outside the fire scar, near the edge	33% (30)
	Some distance from the fire scar	10% (9)

A little more than half the properties were on standard-sized residential blocks, a little less than half were relatively larger life-style blocks. There was one agribusiness. Ten per cent of those interviewed had resided at the property for less than 2 years, while half had been resident at the property for more than 12 years. Consistent with findings from previous post-bushfire interviews in NSW in 2013, most residents reported adequate house and contents insurance on the day of the fire, though 18% reported being under- or uninsured for contents. Again consistent with previous findings, level of insurance was **not** found to be related to bushfire safety planning, preparation, or actions on the day of the fire.

Previous Bushfire-Related Experience

Residents were asked about their previous experience with bushfire threat and if any members of their household were, or had been previously, a member of a fire brigade. The following table summarises their responses.

Table 4: Previous bushfire-related experience (*n* = 91)

Previous experience of bushfire threat?	Active defence	11% (10)
	Observation only	31% (28)
Household member of fire brigade?	Current	9% (8)
	Previous	17% (15)

Eleven per cent of residents had previous experience of active defence against bushfire.

- *About 5 years ago over the back in Stoneville Park. I fought for one house to keep the fire off. We watched the fire come in pretty quick, the rest of the neighbours abandoned me and the only thing that saved the house was the helicopter!* (7-A-001)

Thirty-one per cent had observed a threatening bushfire.

- *Since I've lived here there have been two, one was a major and it went through the back of Stoneville about 800 metres away from us. It was scary that day, we had ash and everything coming in.* (4-A-004)

Twenty-six per cent of households had a member with experience as a volunteer firefighter.

Neither previous bushfire experience nor previous volunteer firefighting experience were related significantly to household bushfire planning, preparation, or actions. Of the eight households with a current member of a volunteer fire brigade, five were engaged in firefighting activity and three defended their homes.

Community Connectedness

It has been suggested that level of resident inter-connectedness in a community may be related to disaster resilience generally. A report of findings from interviews with residents of Lake Clifton (WA) impacted by a bushfire on 10 January 2011 noted generally low levels of preparedness for bushfire and raised the possibility that this may have been related to reported low levels of social interaction among residents (McLennan *et al.*, 2011). In a recent post-bushfire interview study of three NSW communities impacted by bushfire in October 2013, it was that found that the community that had the lowest overall level of resident-reported connectedness was relatively more reliant on official advice about bushfire threats (McLennan Wright and Birch 2014).

By drawing upon previous research about residents' sense of community (Long & Perkins, 2003) and discussion with DFES Community Engagement staff, six questions were constructed to measure residents' self-reported sense of community connectedness. The questions and responses are summarised in the following table (Table 5).

Table 5: Indicators of self-reported residents' sense of community connectedness (*n* = 91)

1. About how many people in your local community do you know?	Median number	9
2. Do you think most of your neighbours know you?	Yes	87% (79)
3. Do neighbours cooperate if there are issues or problems in the area – say with grass or bush building up?	Yes	51% (46)
4. Do you feel any sense of personal connection with your neighbours?	Yes	50% (45)
5. Do neighbours socialise with each other?	Yes	50% (45)
6. If you needed help, say with transport, could you get this easily from your neighbours?	Yes	88% (80)

In order to explore the possible role of residents' sense of community connectedness in relation to bushfire safety, a Sense of Community Connectedness Index (SCCI) was constructed. In answers to Question 1 above ('About how many people do you know in your local community?'), the median

number was 9 and a median split was used to categorise residents as relatively high or low on sense of community connectedness: residents reporting a number of 9 or less were categorised as relatively 'Low' and assigned a score of 0, those reporting 10 or more were categorised as relatively 'High' and assigned a score of 1. For Questions 2–6, a 'Yes' answer was scored as 1 and a 'No' answer scored as 0. A resident's SCCI score was then the sum of responses to the six questions. Scores could range from 0 to 6.

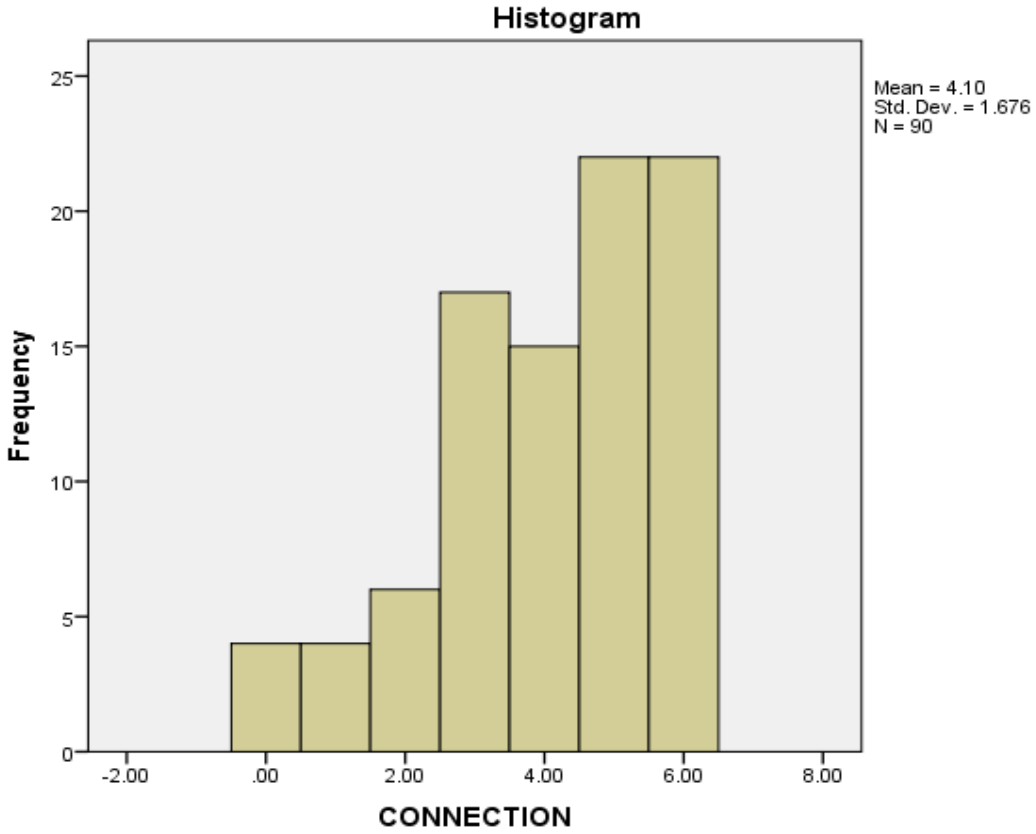

Figure 1: Frequency distribution of Sense of Community Connectedness Index scores.

The distribution of SCCI scores is quite negatively skewed – that is, there is a 'pile-up' of scores at the high end: most residents had relatively high SCCI scores. More information on the psychometric properties of the SCCI is in Appendix D. In subsequent sections, associations between residents' reported sense of community connectedness and aspects of bushfire safety are commented upon where appropriate; however, as noted in the *Discussion* section, SSCI scores were not found to be correlated with residents' bushfire safety intentions or actions.

Community Bushfire Safety Activities

Residents were asked which, if any, of a range of community bushfire safety activities or initiatives they had participated in over recent years (Table 6).

Table 6: Community bushfire safety activity participation* (N = 91)

Attended Mundaring Shire information session	7% (6)

Attended a Bushfire-ready group meeting	2% (2)
Attended a bushfire information street meeting	2% (2)
Participated in the Mundaring Shire on-line bushfire exercise	1% (1)
Did not participate in any bushfire safety activity	88% (80)

* None of the 11 respondents took part in more than one activity.

Twelve per cent of those interviewed reported participating in a community bushfire safety activity over recent years prior to the 12 January 2014 fire. Few reported participating in any given activity. Participation was not related to SCCI score.

Bushfire-Risk Perceptions Prior to the 12 January 2014 Fire

Residents were asked to rate how concerned they were about a possible bushfire threat prior to the 12 January 2014 fire.

Table 7: Pre-bushfire threat ratings (*n* = 91)

Quite concerned • *Absolutely concerned! Every summer I would live in trepidation that it could happen and you just live in hope that it won't happen.* (5-A-001)	56% (51)
Some concern • *We've always been concerned since we moved up here, we knew it was a real possibility.* (4-A-005)	21% (19)
Slight concern • *Not too concerned. We live up here knowing it could always happen and it's a thought in the back of your mind.* (7-A-004)	14% (13)
No concern • *Not really concerned at all. You don't think it will happen to you.* (5-A-009)	9% (8)
Neighbours had a similar attitude to possible bushfire threat • *I think everyone was aware of the risk. You are willing to take the risk because it is such a lovely place to live. You do the best you can.* (5-A-009)	51% (46)

Seventy-seven per cent of residents reported having been 'quite' or 'somewhat' concerned about the possibility of a bushfire threat prior to the 12 January 2014 fire. More residents on large life-style blocks were 'quite concerned' (64%) compared with residents on standard-sized blocks (48%). Level of concern about bushfire threat was not related to SCCI score. However, SCCI score was related weakly to a 'yes' response to 'Neighbours had a similar attitude to bushfire threat': Spearman's rho = 0.241, p = 0.04.This suggests that residents who view themselves as being more socially connected are somewhat more likely to share concerns about bushfire threat with neighbours.

Team Assessments of House Proximity to Significant Vegetation

Teams were asked to estimate the distance of each house from significant vegetation (Table 8).

Table 8: Team estimates of the distance of the house from the nearest significant vegetation stand (*n* = 91)

0–5 m (house amidst trees)	4% (cumulative %)
10 m	21% (24%)
20 m	17% (41%)
30-40 m	12% (53%)
50 m	19% (72%)
60 m	1% (73%)
70 m	1% (74%)
80-90m	2% (76%)
100 m	10% (86%)
200 m	3% (89%)
300 m	3% (92%)
400 m	1% (93%)
500 m or more	6% (100%)

Australian historical data about house loss during bushfires and proximity to bushland suggests that the major determinant of house losses during bushfires is distance of the house from significant vegetation, with about 80% of houses destroyed being within 100 m (Blanchi *et al.,* 2012; Chen & McAneney, 2004; Crompton *et al.,* 2010; Price & Bradstock, 2012). According to interview team estimates, 86% of the households interviewed lived in houses within 100 m of significant vegetation. There was only a weak association between residents' reported levels of concern and team estimates of the proximity of houses to vegetation (Spearman's *rho* = 0.25, *p* = 0.018): that is, residents with houses closer to vegetation were only somewhat more likely to report higher pre-bushfire levels of concern about bushfire threat.

Sources of Bushfire Safety Information

Residents were asked to list the sources they had used in recent years to find out about bushfire safety (Table 9).

Table 9: Sources of bushfire safety information (*n* = 91)

Mundaring Shire: information with rates notice	65% (59)
DFES *Prepare. Act. Survive.* booklet	30% (27)
Participation in a Bushfire-ready group	12% (11)
Information from a local fire brigade	10% (9)
Advice from family/friends/neighbours	8% (7)
Information from the DFES website	8% (7)
DFES *Homeowner's Bush Fire Survival Manual*	1% (1)
Am I at Risk of Bushfire? booklet	1% (1)

The most frequently mentioned source of bushfire information was a booklet sent to residents each year by Mundaring Shire with the rates notice. Thirty per cent made mention of the *Prepare. Act. Survive.* booklet

Bushfire Plans Prior to the 12 January 2014 Fire

Residents were asked if they had a bushfire survival plan prior to the 12 January 2014 fire. Eighty-one per cent (74) said that they had a bushfire plan, while 19% (17) said that they did **not** have a bushfire plan. Seven residents (8%) said that their plan was written; that is, of the 74 residents who had a plan, 10% of them had a written plan; 84% of those with a plan had discussed it with other household members, and 36% reported having a backup plan (mostly alternative ways of leaving the property if the primary egress route was blocked – generally, on foot):

- *One of the reasons we bought here was the access, we could drive out through the street or walk out through the Park.* (3-A-012)

Residents who had a plan were asked to describe the plan. Table 10 summarises these.

Table 10: Household plans prior to the 12 January 2014 bushfire (*n* = 91)

All household members leave • *Leave, because of the type of house. It has a wooden ceiling and all the window frames and doors are wood.* (4-A-004)	49% (45)
All household members stay and defend • *The plan always was that we would stay and defend the house. We have a 32,000-litre extra tank of water for this.* (4-A-001)	14% (13)
Some household members leave, other stay and defend • *After the Roleystone fire* [February 2011], *my husband went out and bought a pump… so that if we had a fire he could hook it up to the water tank and he could fight the fire. My husband would stay and defend and I would take the kids to a safer place – my mum's at D_____*. (3-A-001)	11% (10)
Household members wait and see how bad it is, then decide • *We've talked about it a fair bit. Depending on the severity of the fire, we would stay and defend if it was a small grass fire, but we wouldn't stay if the fire was too big.* (5-A-008)	7% (6)
No concrete plan described • *No, not really. We never thought it would ever happen.* (3-A-012)	19% (17)

The percentage of residents reporting a pre-fire bushfire plan to either leave or to stay and defend (74%) was appreciably higher than that reported by NSW residents interviewed following the October 2013 bushfires (54%). The corresponding percentages for those interviewed following the 2011 Lake Clifton (WA) and Perth Hills fires were 75 and 70%, respectively (McLennan, Dunlop *et al.* 2011; Heath *et al.*, 2011). The percentage of residents intending to wait and see (7%) was appreciably less than that of their NSW counterparts (14%). The corresponding percentages for those interviewed following the 2011 Lake Clifton (WA) and Perth Hills fires were 5% and 22%, respectively.

Social connectedness (SSCI) scores were not related either to choice of plan, or to having or not having a plan.

Residents were asked to explain why they had decided on their particular bushfire plan. Table 11 summarises their reported reasons.

Table 11: Reasons for deciding on a particular plan (*n* = 91)

Plan	*Main stated reason*	*% (n)*
All leave (*n* = 45)	General danger posed by adjacent vegetation	56% (25)
	Danger to children	13% (6)
	Danger to family plus house insured	13% (6)
	Age/infirmity/disability of family member(s)	11% (5)
	Lack of confidence in ability to defend	4% (2)
	Danger to pets	2% (1)
All stay and defend (*n* = 13)	Protect house, prepared, confident	69% (9)
	Protect house from danger posed by adjacent vegetation	15% (2)
	Protect house, confident	8% (1)
	Protect house, risk low	8% (1)
Some stay and defend, others leave (*n* = 10)	Protect house, prepared, confident; possible danger to some family members	90% (9)
	Protect house; danger posed by adjacent vegetation	10% (1)
Wait and see how bad it is, then decide (*n* = 6)	Depends on how bad the fire is	50% (3)
	Danger if a bad fire, house is insured	33% (2)
	Easy to leave safely	17% (1)
No concrete plan (*n* = 17)	Thought risk of bushfire low, no need	71% (12)
	Did not know what to do, not confident	29% (5)

The findings are consistent with previous research findings on reasons why residents decide on their particular household bushfire plan: residents who plan to leave do so because of the perceived danger that would be posed by a bushfire, especially if the household includes vulnerable members such as the elderly or young children.

- *We're in our 70s, my life isn't worth my house, the house is insured.* (3-A002)

Most residents who plan to stay and defend do so in order to protect their valued property – the 'valuing' can be understood as a spectrum: at one end, the valuing is financial, when the property is associated with a business and income; at the other end, the valuing is emotional 'attachment to place'. Staying and defending is seldom understood by residents as a bushfire *survival* plan; rather, it is understood by most to involve some level of acceptable risk. Residents who intend to wait and see what develops before making a final decision typically do this because: (a) they perceive their bushfire risk to be low; (b) they believe that waiting will not add to their risk; (c) they view leaving unnecessarily and having to defend against a severe fire as equally unappealing; and (d) they intend

to wait and hope for the best that the fire does not threaten their property (McLennan & Elliott, 2013; McLennan *et al*., 2012; McLennan *et al*., 2013; McLennan *et al*., 2014a).

Residents were asked if they had used DFES information sources in deciding on their plan: 16% (15) reported making use of the *Prepare. Act. Survive.* document; only one resident reported making use of the *Homeowner's Bush Fire Survival Manual*.

The plans of residents on standard-sized block were compared with those on large life-style blocks.

Table 12: Residents' plans: standard-size blocks versus large life-style blocks (*n* = 90)

Plan	*Standard blocks (n = 48)*	*Life-style blocks (n = 42)*
All leave	58%	41%
All stay and defend	6%	21%
Some stay and defend, others leave	6%	17%
Wait and see	6%	7%
No concrete plan	23%	12%

One additional property was an agribusiness. The residents planned to stay and defend.

Somewhat more residents on standard-sized blocks planned to leave, and more residents of large blocks planned to stay and defend. Residents of standard-sized blocks were more likely **not** to have a bushfire plan.

The levels of pre-fire concern about possible bushfire threat expressed by residents are summarised below in relation to their bushfire plans.

Table 13: Residents' plans in relation to levels of concern about possible bushfire threat (*n* = 91)

Plan	*No concern (n = 8)*	*Slight concern (n = 13)*	*Some concern (n = 19)*	*Quite concerned (n = 51)*	*Totals (n = 91)*
All leave	11% (5)	13% (6)	18% (8)	58% (26)	100% (45)
All stay and defend	0	15% (2)	15% (2)	69% (9)	100% (13)
Some stay and defend, other leave	0	0	20% (2)	80% (8)	100% (10)
Wait and see	0	0	33% (2)	67% (4)	100% (6)
No plan	18% (3)	29% (5)	29% (5)	24% (4)	100% (17)

Residents planning to stay and defend were more likely to report higher levels of concern about possible bushfire threat compared with residents who planned to leave. Residents who did not have a plan were more likely to express low levels of concern.

Social connectedness (SCCI) scores were not related to level of concern.

Preparations for a Possible Bushfire Prior to the 12 January 2014 Fire

Residents were asked what actions they had undertaken in preparation for a possible future bushfire prior to the 12 January 2014 fire.

Table 14: Preparations for a possible bushfire threat prior to the 12 January 2014 fire

Preparation activity		*All leave (n = 45)*	*All stay and defend (n = 13)*	*Some stay, others leave (n = 10)*	*Wait and see (n = 6)*
For leaving:	Evacuation destination chosen	24%	0	30%	17%
	Evacuation route mapped out	11%	15%	20%	17%
	Organised safety of pets	24%	23%	30%	0
	Go-kit prepared	42%	23%	50%	50%
	Decided on trigger for leaving	7%	8%	0	0
Reduce threat:	Removed combustibles	64%	85%	90%	83%
	Cleared vegetation	82%	92%	60%	83%
Protect house:	Sealed gaps	2%	0	0	0
	Window protection	0	0	0	0
	Installed sprinklers	0	0	0	0
Defend house:	Water supply	4%	69%	60%	17%
	Power source	0	69%	60%	0
	Firefighting hoses	4%	54%	30%	17%
	Protective clothing	0	46%	40%	0

The overall pattern of findings is broadly consistent with previous findings from post-bushfire interviews in 2013 in NSW and Tasmania about residents' bushfire safety preparations with respect to those who did not plan to stay and defend their property (Mackie *et al.*, 2013; McLennan Wright and Birch 2014; Boylen *et al.*, 2013). Few residents whose plan was to leave were prepared adequately for this eventuality. Somewhat less than half (42%) had a kit of valuables ready for immediate departure; 24% had a chosen destination; 11% had mapped out a safe evacuation route; and only 7% had identified an appropriate trigger-event for leaving safely if threatened.

Those planning to stay and defend were rather better prepared for active property defence than their counterparts in previous studies: 69% had both an independent water supply and a source of power independent of mains electricity. Two previous studies found that few residents planning to stay and defend had both these defensive resources: Lake Clifton (WA) – 6% (McLennan *et al.*, 2011); NSW October 2013 – 17% (McLennan Wright and Birch 2014).

In relation to mitigating risk to houses, the majority of residents reported undertaking the easy and inexpensive activities of removing combustible material and clearing vegetation from their property, but none had undertaken more complex or expensive activities to reduce vulnerability of their home to bushfire attack, such as protecting windows or installing a protective sprinkler system. Most reported some variant of the following:

- *Basically, just clearing around the house.* (5-A-009)

(Requirements for safe defence of houses against bushfire attack are discussed extensively by Penman *et al.* (2013). For comparison purposes, a summary of preparations reported in a survey of residents of at-risk locations in south-eastern Australia conducted in 2012 is in Appendix E).

SCCI scores were not related to bushfire preparation activities.

Readiness Preceding the Fire

Residents were asked about their concerns and any extra bushfire threat-related preparations in the week preceding the fire. Almost all commented on the hot weather (Table 15).

Table 15: Reported indications of bushfire readiness immediately preceding the day of the fire

Immediate pre-fire readiness activity	*% reporting (no. reporting/total no.)*
Undertook extra bushfire safety preparations (mostly clearing leaf litter from the yard and cleaning roof gutters)	34% (31/91)
Discussed possible increased bushfire threat with neighbours	6% (5/91)
Noted fire danger predictions for Sunday 12 January	50% (45/91)
Extra bushfire safety preparations on the morning of Sunday 12 January (mostly clearing leaf litter from the yard and cleaning roof gutters)	11% (9/82)*

*Note that nine of the residents interviewed were not at their home on the morning of Sunday 12 January 2014 by chance, not because of a bushfire safety-related decision.

Few residents equated the hot and dry conditions preceding 12 January 2014 with an increase in bushfire danger.

- *Honestly, it didn't enter our heads.* (6-A-004)

For most, it was simply a heat wave to be endured.

- *Yes, it was a Total Fire Ban. We really didn't do anything to prepare. We'd set up the blow-up pool but we were trying to keep cool more than anything.* (5-A-007)

First Indications of Bushfire Threat on 12 January 2014

Residents were asked how they first became aware that there was an actual bushfire threat on Sunday 12 January 2014 (the fire was first detected at about 1130 hours). Their responses are tabulated below (Table 16). Note that many residents reported more than one first indicator, and it is probably more appropriate to interpret the reports as referring to 'very early' indications of a bushfire threat.

Table 16: First indications of a bushfire on 12 January 2014 (*n* = 82[a])

Sight of smoke	71% (58)
Saw flames	4% (3)
Emergency Alert (SMS)[b]	40% (33)
Emergency Alert (landline message)[b]	6% (5)
Indications of bushfire response: sound/sight of aircraft; sound/sight	40% (33)

of firefighting/police vehicles	
Phone call from neighbours/family/friends	27% (22)
Information on ABC local radio	10% (8)
DFES website	6% (5)
Mundaring Shire Facebook	4% (3)
ABC News 24 television	1% (1)
DFES Twitter feed	0
Other Twitter feed	0

[a] Note that nine of the 91 residents interviewed were not at home the morning of the fire

[b] Note that almost all those who were in the area on the day of the fire reported receiving an Emergency Alert message.

Consistent with previous findings, the most frequently reported early indications of a bushfire threat were physical cues from the environment: smoke, flames, sounds. However, almost half (46%) reported an Emergency Alert (SMS, landline message) as an early indication of bushfire threat. Social media hardly figured as a source of early threat warning. The finding that environmental cues are most commonly reported as early indicators of an emerging bushfire threat is consistent with those from previous studies: Victoria 2009 (Black Saturday) – 89% (McLennan *et al*., 2011); Lake Clifton (WA) – 92%; Tasmania 2013 –37%; NSW January 2013 – 60%; NSW October 2013 – 73%.

Residents' Locations and Actions When the Fire Was First Reported

Of the 91 householders interviewed, four were not in the area on the morning of 12 January 2014 and decided that they were too far away to return. It should be noted that **no** members of interviewed households had left for a presumed safer location on the basis of the Extreme fire danger weather conditions predicted for Sunday 12 January 2014. This finding is consistent with previous findings from Bushfire CRC post-bushfire interviews, including the 2009 Victorian Black Saturday bushfires: very few residents will leave solely on the basis of a prediction of Very High or Extreme fire danger weather. For the 2013 Tasmania fire, 1% (2) of the 245 residents interviewed had left early on the basis of a predicted Catastrophic fire danger day.

Of the 87 householders in the area on the day of the fire, 25 were away from their home when the fire was first reported (family and social activities, children's sporting and cultural activities, church attendance, work). Of these, four decided that it would be too dangerous for them to try to return; another three attempted to return but were prevented by road blocks. Of the 18 householders in the area who were not at home when the fire was first reported but *returned* to their homes when they became aware of the bushfire threat (20%; 17/87), 4 of these stayed and defended, while 14 left subsequently.

Sources Used by Residents Seeking More Information About the Fire

Residents (*n* = 80) who were at their home during some period of the bushfire event were asked what, if any, sources of additional information they used to find out more about the fire once they became aware of the initial bushfire threat. Their responses are tabulated below. Note than some residents used several sources.

Table 17: Sources used by residents seeking more information about the fire (*n* = 80)

Looked at the DFES website	39% (31)
Phoned friends/family/neighbours	26% (21)
Listened to ABC 720 Radio	18% (14)
Looked at the ABC 720 website	11% (9)
Looked at the Shire Facebook site	11% (9)
Listened to commercial radio	9% (7)
Watched ABC TV news	5% (4)
Watched commercial TV news	5% (4)
Drove to see the fire location and intensity	3% (2)
Phoned the DFES 1300 information number	1% (1)
Checked DFES Twitter feed	1% (1)
Checked other Twitter feed	0

The DFES web site was the most frequently reported source consulted for additional information about the fire. Several of those who reported using the website commented that they thought updating was slow.

- *So we looked around and saw smoke so we immediately went to the DFES website but there was nothing yet so we kept refreshing it… We just waited because we did not know what direction the fire was going in. That was the only thing that concerned us, because it was a full hour before the DFES website updated… it was about 12.04.* (4-A-010)

Several commented on the helpfulness of the Mundaring Shire Facebook page.

- *The Shire Facebook was really good, they were the only ones we could get information from about what was going on. Even more so after the fire. Because we weren't allowed back, but people just want to know what's going on.* (7-A-002)

There was limited evidence of use of social media as a source of additional information. In the study of NSW residents impacted by the October 2013 bushfires, 17% of those interviewed reported making use of the NSW Rural Fire Service (RFS) Facebook page and Twitter feed (McLennan Wright and Birch 2014). Most of these NSW residents commented that the NSW RFS Facebook page was more useful than the NSW RFS website because of more rapid updating of information.

In relation to social connectedness, 26% of those interviewed reported that they phoned friends, family or neighbours to find out more information about the fire. This information-seeking action was not related to their SCCI score.

Residents' Initial Decisions

The 80 residents at home during some period of the fire threat event were asked to describe their initial decisions when they became aware of the bushfire threat and the main reasons for these decisions (Table 18).

Table 18: Residents' initial decisions following awareness of bushfire threat (*n* = 80)

Decision	*% (number)*
All leave	40% (32)
All stay and defend	15% (12)
Some stay and defend, others leave	14% (11)
Wait and see how things develop, then decide	31% (25)

For most who decided to leave, there was a notable lack of both readiness to leave and urgency:

- *I got the first text message, so I went out and said to my husband, "We really need to think about this." So he agreed it was time to start getting organised. We started packing up: the child, the cats, items, etcetera. Then it was about 25 minutes later and the Stoneville SMS warning came through and he said, "It's really time to go." So when he packed our son in the car, I packed a suitcase. So we got in the car and left, it was about 45 minutes or so from when we first heard to when we ended up leaving. I have to confess we were worried we were jumping the gun.* (6-A-004)

Table 19: Residents' main reasons for their initial decisions (*n* = 80)

Initial decision	*Main reason*	*% (number)*
All leave (*n* = 32)	Plan: non-specific perception of possible danger	47% (15)
	Advised to leave by friends/family/neighbours	34% (11)
	Plan: specific indication of likely threat	9% (3)
	Concern for dependents, specific indication of likely threat	9% (3)
	Total %	100%
All stay (*n* = 12)	Prepared, confident, experienced	58% (7)
	Prepared	25% (3)
	Plan	17% (2)
	Total %	100%
Some stay and defend, others leave (*n* = 11)	Fire seemed unlikely to threaten	64% (7)
	Prepared, confident	36% (4)
	Total %	100%
Wait and see (*n* = 25)	Uncertainty about whether the fire would pose a threat to the property	80% (20)
	Believed fire unlikely to threaten the	20% (5)

	property	
	Total %	100%

The reasons provided for their initial decisions are consistent with the reasons given for planning to leave, stay and defend, or wait and see, respectively: potential danger; potential threat posed to house plus confidence of successful defence; uncertainty and hoping the threat would come to nothing.

Regarding social connectedness, there was no evidence of a link between SCCI score and nomination of any particular reason for the initial decision.

Residents' initial decisions were compared with their pre-fire bushfire safety plans (Table 20).

Table 20: Household initial decision in relation to pre-fire bushfire plan (*n* = 80)

Note: the blue-shaded cells indicate correspondence of pre-fire plan and initial decision.

Pre-fire plan	*Initial decision: Leave*	*Initial decision: Stay and defend*	*Initial decision: Some stay and defend, others leave*	*Initial decision: Wait and see*	*Total percentage (number)*
All leave	62% (26)	0	5% (2)	33% (14)	100% (42)
All stay and defend	0	100% (11)	0	0	100% (11)
Some stay and defend, others leave	10% (1)	0	60% (6)	30% (3)	100% (10)
Wait and see, then decide	0	0	0	100% (4)	100% (4)
No concrete plan	39% (5)	8% (1)	23% (3)	31% (4)	100% (13)
Total number	32	12	11	25	80

The information in Table 20 is consistent with that from previous findings: the major driver of a resident's initial decision is his or her prior plan.

Residents' Final Decisions and Actions

The 80 residents at home during some period of the fire threat event were asked to describe their final decisions and the main reasons for these decisions.

Table 21: Household final decisions and actions (*n* = 80)

Final actions	*% (number)*
All left	69% (55)
All stayed and defended	15% (12)
All stayed, but did not have to defend: the fire never threatened	3% (2)

Some stayed and defended, others left	14% (11)
Those who stayed and protected neighbours' houses	52% (13/25)
Those who left (*n* = 55) plus those absent (*n* = 11) whose houses were protected by neighbours	33% (22/66)

It is noteworthy that more than half of those who stayed and defended their property also protected neighbours' homes. One-third of those who left or were absent reported that neighbours had defended their homes.

Regarding social connectedness, there was no evidence that SCCI score was linked to residents' final decisions.

Residents were asked to state the main reason for their final decision. Their responses were analysed for content and are tabulated below.

Table 22: Main reasons for residents' final decisions

Reason for action	*% (number)*
Left (n = 66)*	
Specific threat trigger	44% (29)
Planned to leave when it was clear there was a threat	26% (17)
Concern for dependents and a specific threat trigger	12% (8)
Told to leave by police or firefighters	9% (6)
Felt it was time to leave	8% (5)
Had done all they could for the house, too dangerous to stay	2% (1)
Stayed (n = 25)	
Prepared, confident	32% (8)
Fire seemed unlikely to threaten seriously	32% (8)
Prepared, confident, experienced	28% (7)
Always the plan	4% (1)
Too dangerous to leave	4% (1)

* Includes 11 from those households where some members stayed and defended and others left.

The reasons are consistent with those that generated residents' pre-fire bushfire plans: those who left did so because of perceived danger associated with staying.

- *My husband told me to leave, he didn't want me hanging around. I would have been happy to stay but having the three kids, my husband said to go, because he didn't want to have to worry about us and the fire*. (3-A-001)

For almost half, the action of leaving was triggered by a development signalling that danger was imminent (see Table 24).

Those who stayed (with one exception) did so in order to protect their valued property and were confident of success in relation to perceived risk. The exception had planned to leave, but because his egress route would have taken him close to the fire, he decided that it was safer to stay and defend the property.

Residents' final actions were compared with their reported pre-fire bushfire plans (Table 23).

Table 23: Household final actions in relation to pre-fire bushfire plans

Note: the blue-shaded cells indicate correspondence of pre-fire plan and final action.

Pre-fire plan	*Final action: All left*	*Final action: All stayed and defended*	*Final action: All stayed but did not have to defend*	*Final action: Some stayed and defended, others left*	*Total % (number)*
All leave	91% (39)	5% (2)	2% (1)	2% (1)	100% (43)
All stay and defend	10% (1)	80% (8)	10% (1)	0	100% (10)
Some stay and defend, others leave	30% (3)	20% (2)	0	50% (5)	100% (10)
Wait and see, then decide	75% (3)	0	0	25% (1)	100% (4)
No concrete plan	69% (9)	0	0	31% (4)	100% (13)
Total number	55	12	2	11	80

The major driver of final action for most was a decision that their bushfire plan could, and should be implemented. In this instance, the link between pre-fire plan and final action was equally strong for those who left and for those who stayed.

Residents who left were asked what the trigger was for them to actually leave their property. Their responses are tabulated below. Note that many residents mentioned more than one trigger.

Table 24: For those who left, reported trigger for leaving (*n* = 55)

Trigger	*% (number)*
Sight of smoke	47% (26)
Emergency Alert message (SMS, landline)	40% (22)
Saw flames approaching	24% (13)
Face-to-face advice from neighbours	18% (10)
Heard/saw firefighting aircraft nearby	16% (9)
Phone information from friends/family/neighbours	15% (8)
Face-to-face advice from firefighters/SES/police	5% (3)

Ordered to leave by police	4% (2)
ABC Radio 720 warning	4% (2)
Fire impacted on property	2% (1)

Noteworthy features of Table 24 include: (a) the role of physical cues from the environment signalling escalating danger; (b) the importance of the Emergency Alert system; (c) the significance of the social dimension – information and advice from trusted 'others'; and (d) the absence of any mention of social media.

Four residents interviewed who were present on the day (4/80 = 5%) reported that their safety was compromised by power failure and consequent loss of communication.

- *I said to the kids, "Pack your bags" and I was going to go. But R _____ said, "No, it will be alright." Then, really, within half an hour we couldn't go anymore. The power was gone. So we had no access to phones. We don't have mobile coverage here. We couldn't access the internet and we didn't have the radio. So we were pretty much stuck here*. (7-A-14)

OUTCOMES

Residents were asked about the outcomes of the bushfire event on 12 January 2014.

Table 25: Outcomes of the bushfire for residents (*n* = 91)

Outcomes	*% (number)*
Fire never actually threatened, no damage or loss	23% (21)
Fire threatened, but no damage or loss	22% (20)
Minor damage to house and/or surrounds	47% (43)
Major damage to house	5% (5)
House destroyed	2% (2)
Pets/livestock killed or injured	7% (6)

Only two of those interviewed described surviving a potentially dangerous situation. Both described being surprised by the sudden fire threat, being uncertain about what to do, and fleeing at the last moment in their vehicles. Both described feelings of panic.

Hindsight into the Future!

Residents were asked if they would do anything differently if threatened by a future bushfire in the light of their experiences on Sunday 12 January 2014. While most households described some things they would do differently in future, these were mainly improvements to their original pre-fire plans – pack extra clothes when evacuating, purchase and install a sprinkler system to protect the house, purchase a car charger for their mobile phone, etcetera. Of the 45 residents who had planned originally to leave, eight (18%) said that next time they would stay and defend. Of the 13 residents who had planned originally to stay and defend, three (23%) said that next time they would leave. Of the 10 households where the original plan was for some to stay and defend while others left, three (30%) said that next time all would leave. Of the 17 residents who had no plan, three (18%) said that

next time, they would prepare and stay and defend, while 14 (82%) said that next time they planned to leave.

Post-Bushfire Experiences

Many residents commented critically on their experiences of being either unable to return to their properties after evacuating or being unable to leave their properties after defending them because they would be prevented from returning by police road blocks – some of those who remained described a degree of hardship over the course of the exclusion. However, few of those interviewed expressed anger or hostility towards authorities. For most, it was accepted wearily as an unfortunate necessity with the fervent wish that 'somebody' would come up with a better approach to residents returning speedily to their bushfire-affected properties. Several suggested a tally-board system at road blocks where *bona fide* residents checked themselves in and out after having signed a waiver of liability. Residents being prevented from returning to their properties following a bushfire on the grounds of safety has emerged as a highly contentious and emotion-charged issue in every post-bushfire study conducted by the Bushfire CRC. However, no progress seems to have been made on developing a protocol for police and other agencies to follow that addresses both safety issues and the needs of some residents to return to their properties.

Those interviewed were almost universally fulsome in their praise of firefighting endeavours on the day, and how the Shire of Mundaring managed the recovery process. Several described acts of notable generosity and effort on the part of recovery centre officials and staff (not described here so as to protect the anonymity of the interviewees concerned).

DISCUSSION

1. Agency–Researchers Collaboration

The use of joint BNHCRC–DFES teams worked well. It seemed that many householders responded positively to the involvement of the BNHCRC as an agency independent of WA police, fire and emergency services. The respect in which DFES members are held in the community meant that interview teams were mostly welcomed when they visited properties. DFES Community Engagement staff provided the necessary expert knowledge of community bushfire safety in the WA context.

2. Interviewee Demographics

The under-representation of: (a) householders under 35 years of age, and (b) residents whose homes were destroyed is a limitation on the extent to which the findings can be generalised across the area. For future post-bushfire interview studies, ways of addressing these two issues will need to be considered. Possibilities include developing systematic procedures for arranging more telephone interviews in the evening when householders who work are likely to be at home; and arranging, via the relevant post-bushfire relief organisation, for residents who have moved from the area because of house loss to be sent details of the study and invited to take part in telephone interviews.

3. Community Connectedness

Sense of Community Connectedness Index (SCCI) score was not found to be related to: (a) pre-bushfire risk concerns, (b) bushfire plans, (c) bushfire preparations, or (d) decisions and actions on the day of the fire. It was noted that scores were rather high (mean = 4.1) in relation to the maximum possible score of 6. It may be that an index of sense of community, or similar, is useful for comparing communities, rather than for comparing individuals within a given community. Further research is needed to better understand the possible role of constructs such as sense of community and community member inter-connectedness in community bushfire safety.

4. Community Bushfire Safety Activities

It was noted that very few of those interviewed had taken part in organised bushfire safety activities. The most frequently reported source of information about bushfire safety was material mailed by the Shire of Mundaring with annual rate notices. It may be useful for DFES staff to review their bushfire safety material used currently. Perhaps brief flyers widely distributed may have greater impact than relying on residents availing themselves of detailed multi-page publications and detailed material on the DFES website.

5. Householder Bushfire Preparation

While the percentage of residents with a pre-12 January 2014 bushfire plan (81%) was appreciably higher than comparable figures from other Bushfire CRC post-bushfire interview studies (where about two-thirds of those interviewed reported having a bushfire plan), levels of preparation for a bushfire threat were low for those who did not plan to stay and defend. It seems that for many residents of bushfire-prone areas, bushfire danger remains an intellectual possibility rather than a danger that could suddenly become a real threat to life and property. More householders who planned to stay and defend their homes were well prepared compared with findings from previous post-bushfire interview studies.

6. Fire Danger Weather Warnings

In relation to bushfire readiness, the findings were consistent with previous studies. Predictions of elevated fire danger weather (Very High, Extreme, Code Red or Catastrophic) do not generally motivate householders to take action. None of those interviewed left early on the basis of Extreme fire danger weather predictions. Beginning with Victoria's 2009 Black Saturday bushfires, Bushfire CRC post-bushfire interviews have found that probably no more than 2% of residents are likely to leave for a safer location solely on the basis of fire danger weather predictions. Those who do leave perceive themselves to be very vulnerable to bushfire threat: families with young children, residents who are elderly, those who have survived a previous serious bushfire threat, those whose home is not defendable. At present, it seems prudent for agencies to assume that almost all the residents of an area threatened by a fire outbreak will react to an actual fire threat warning, not to a prediction of fire danger weather.

7. Social Media

On the basis of residents' accounts, use of social media (Facebook pages, Twitter feeds) did not figure greatly during the Parkerville bushfire threat period. However, it must be kept in mind that many of those interviewed were aged 65+ years and thus less likely to be social media users compared with residents aged under 35 years. The role of social media in potential disaster situations needs to be monitored. Interviews with NSW residents impacted by bushfires in October 2013 indicated considerable use of the NSW RFS Facebook page. However, over-reliance by agencies on social media may have an unfortunate side effect of disadvantaging the elderly and those whose financial circumstances do not allow them to be social media users.

8. Bushfire Plans and Bushfire Safety Messages

Given that the three types of residents' pre-fire bushfire plans (leave; stay and defend; and wait and see) seem to arise from rather different motivations (avoid danger, protect assets, avoid making an unnecessary decision), perhaps information specifically targeting each type of resident may be more effective than omnibus information about bushfire survival in general.

CONCLUSIONS

Clearly, from the complex picture of residents' experiences of the Parkerville Fire of 12 January 2014 that has emerged, community bushfire safety continues to be one of those 'wicked problems' (Head, 2008) that bedevil 21st-century government organisations in Australia – including fire and emergency

services agencies. The findings from the interviews with residents affected by the 2014 Parkerville Fire are quite similar to those that have emerged from previous post-bushfire interview studies conducted by the Bushfire CRC from 2009 to 2013 (McLennan, 2014; see Appendix F).

- A significant percentage of residents of communities that are at risk of bushfire do not believe that they are at risk and, accordingly, neither plan nor prepare for a possible bushfire.
- Written plans are a rarity.
- An appreciable percentage of residents who have a bushfire plan undertake no or inadequate preparations to implement that plan – especially a plan to self-evacuate safely.
- A minority of residents of at-risk communities take part in community bushfire information activities or make use of detailed community bushfire safety information sources.
- Very few residents of at at-risk communities self-evacuate early on the basis of fire danger weather predictions.

Suggestions to Consider

Note that it is problematic for a researcher from Victoria to offer suggestions about improving community bushfire safety endeavours in Western Australia – it is quite possible that any such suggestions have been considered previously and rejected for good reasons, or been implemented or under consideration already, or are impractical given local legislative, budgetary or political realities.

1. Establish a state-wide bushfire risk register for homes and key assets in relation to potential bushfire threats in local government areas. (Such programs are in progress in NSW and Victoria.)
2. Establish a program of consultation with at-risk communities in order to establish jointly agreed priorities for protecting community assets. (Such a program is in progress in Tasmania.)
3. In consultation with local governments, establish key performance indicators of community bushfire safety preparedness in at-risk locations, set goals for progress, and monitor progress as a matter of routine – by telephone surveys, for example.
4. Conceptualise community bushfire safety as a specific instance of a general issue of community health promotion and injury prevention – resembling in many ways problems such as drink-driving, smoking, skin cancer and farm tractor rollovers. Study how such health-promotion and injury-prevention problems have been addressed and borrow ideas that seem relevant (see Bushfire CRC Fire Note #71, December 2010: http://www.bushfirecrc.com/managed/resource/applying_social_psychology.pdf). Note that none have been addressed effectively by a single 'magic bullet' initiative. Successes have (a) been modest; (b) been costly and slow to progress; and (c) resulted from multiple, simultaneous, diverse, initiatives. Reduction in road deaths associated with drink-driving may be instructive, where simultaneous application of 'Three Es' appears to have been responsible: Education, Engineering and Enforcement. Community bushfire safety appears to rely very heavily on Education, mostly in the form of (i) making detailed written information available to members of the public, and (ii) exhorting them to read and act on the basis of this written information. Such an approach is undoubtedly important, but seems unlikely to produce dramatic improvements in community bushfire safety beyond present levels. Explore additional ways of raising awareness of bushfire risk leading to action – borrow from other organisations concerned with other hazards: *Green Cross* may serve as an example (http://www.greencrossaustralia.org/). Consider developing on-line interactive instructional approaches (NSW RFS is trialling such an approach to mitigation of bushfire danger to homes). Explore ways of fostering local community initiatives beyond traditional

Fireguard units and similar. The *Be Ready Warrandyte* initiative (http://warrandyte.org.au/) may be a useful example.

5. Re-evaluate those 'traditional' bushfire safety messages (implicit or explicit), and their delivery, that appear to have had little or limited impact, such as: 'make a written plan'; 'leave early on a day of predicted high fire danger'; 'don't wait and see'.
6. Establish, or re-activate, a high-level inter-agency working party to develop better ways of managing prompt return of residents to bushfire-affected areas as a matter of urgency.
7. Keep in mind a fundamental principle from the human factors discipline: it is better to put in place systems that match what people actually do, rather than put in place systems that rely on them doing as we wish they would.

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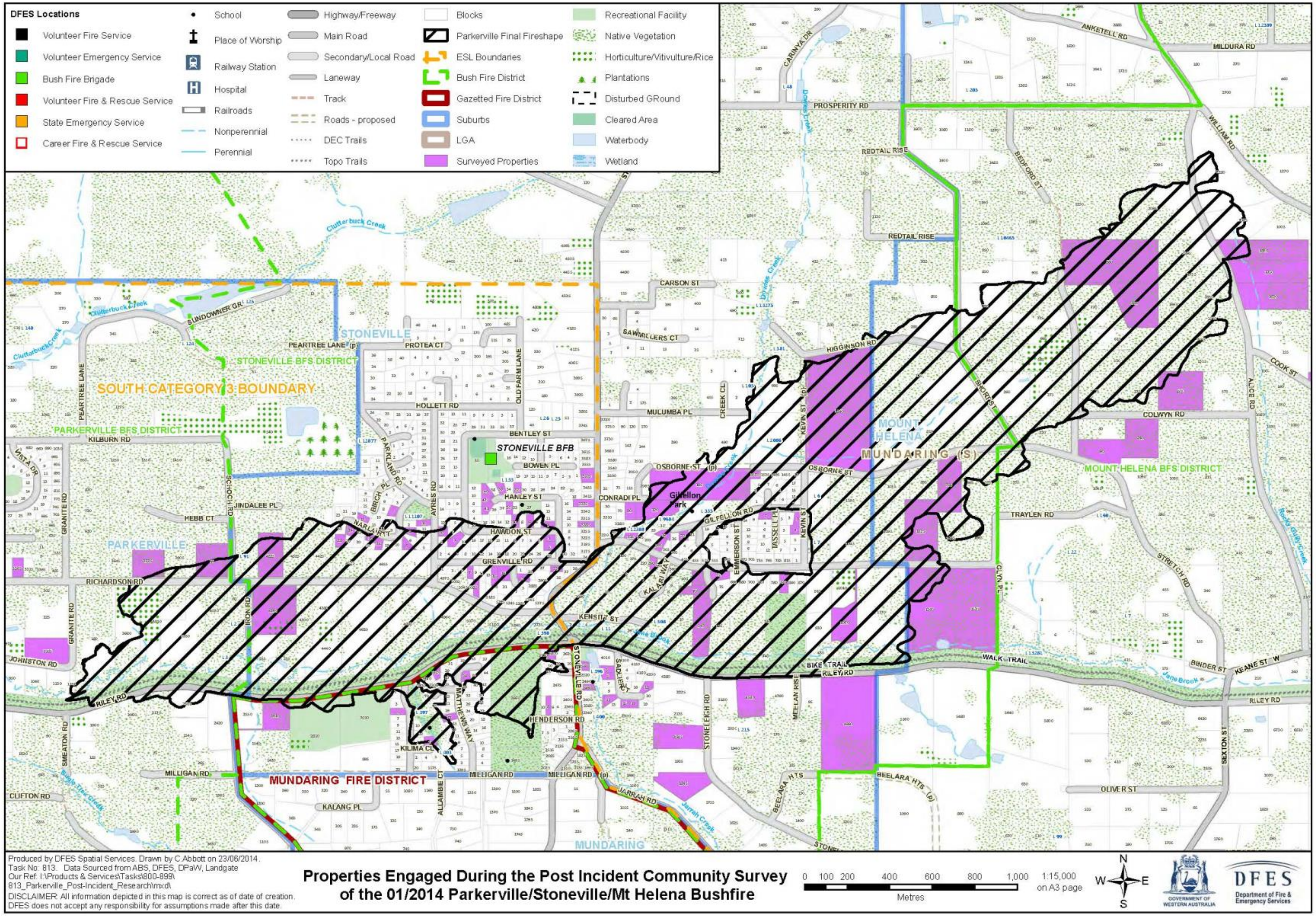
APPENDIX A

A map of the fire scar area and locations of households interviewed follows.


DFES Locations
Volunteer Fire Service
Volunteer Emergency Service
Bush Fire Brigade
Volunteer Fire & Rescue Service
State Emergency Service
Career Fire & Rescue Service
School
Place of Worship
Railway Station
Hospital
Railroads
Nonperennial
Perennial
Highway/Freeway
Main Road
Secondary/Local Road
Laneway
Track
Roads - proposed
DEC Trails
Topo Trails
Blocks
Parkerville Final Fireshape
ESL Boundaries
Bush Fire District
Gazetted Fire District
Suburbs
LGA
Surveyed Properties
Recreational Facility
Native Vegetation
Horticulture/Vitivulture/Rice
Plantations
Disturbed GRound
Cleared Area
Waterbody
Wetland
STONEVILLE
STONEVILLE BFS DISTRICT
SOUTH CATEGORY 3 BOUNDARY
PARKERVILLE BFS DISTRICT
STONEVILLE BFB
PARKERVILLE
MOUNT HELENA
MUNDARING (S)
MOUNT HELENA BFS DISTRICT
MUNDARING FIRE DISTRICT
MUNDARING
Produced by DFES Spatial Services. Drawn by C Abbott on 23/06/2014.
Task No: 813. Data Sourced from ABS, DFES, DPaW, Landgate
Our Ref: I:\Products & Services\Tasks\800-899\813_Parkerville_Post-Incident_Research\mxd\
DISCLAIMER: All information depicted in this map is correct as of date of creation. DFES does not accept any responsibility for assumptions made after this date.
Properties Engaged During the Post Incident Community Survey of the 01/2014 Parkerville/Stoneville/Mt Helena Bushfire
0 100 200 400 600 800 1,000
Metres
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GOVERNMENT OF WESTERN AUSTRALIA
DFES
Department of Fire & Emergency Services

APPENDIX B: BNHCRC POST-BUSHFIRE INTERVIEW GUIDE

WA January 2014 Bushfires

Remember: This interview should be a conversation with the householder, not an interrogation; (i) much of what you want him/her to discuss will emerge without you having to ask a specific question; (ii) pay attention to his/her answers so you do not ask questions which have already been answered, or questions which are not applicable to this householder.

---

1. For the record, what is the address of this property?

2. First, have you taken part in any interviews or surveys previously about the January 2014 bushfires?

3. Now, do you mind if we get some basic information. Who usually lives here, and who was here on the day of the fire?
   - (Note gender of the interviewees on checklist)
   - Year born?
   - Employment status?
   - Disabled members of the household?
   - Elderly or frail household members?
   - Pets? Poultry? Livestock?

4. How long have you lived at this address?

5. Is this your main residence?

6. Do you own, rent or manage the residence?

7. What insurance did you have for:
   - House?
   - Contents?
   - Vehicles?
   - Other?

8. Previous experience of bushfire?

9. Are you a current or previous member of a fire brigade?
   - Any other household members who are previous or current fire brigade members?

10. What sort of a community would you say you live in?
    - About how many people in your local community do you know?
    - Do you think most of your neighbours know you?
    - Do neighbours cooperate if there are issues or problems in the area – say with bush or grass building up?
    - Do you feel any sense of personal connection with your neighbours?
    - Do neighbours socialise with each other?

- If you needed help, say with transport, could get this easily from your neighbours?
- INTERVIEWER: INVITE DFES PERSON TO ASK ABOUT ANY COMMUNITY BUSHFIRE SAFETY INITITATIVES.

11. Over the last few years, how concerned have you been about the possibility of a bushfire threatening your home?
    - Did you think your home and your family would be at risk from bushfire?
    - Why or why not?
    - What did your neighbours think about bushfire risk?

12. What general bushfire safety information do you recall receiving in the 12 months prior to the January 2014 fire? (i.e. not related specifically to that fire)

    - INTERVIEWER: INVITE DFES PERSON TO ASK ABOUT DFES MATERIAL.
    - Media?
    - Past fires?
    - Neighbours?
    - Other sources?

13. Before the January fire, did you have a bushfire plan?
    IF YES: What was your plan prior to the January bushfire?
    - Was it written down?
    - Main reasons you decided on this plan?
    - What was it based on? (DFES PERSON, ASK: Did you use any material from the DFES in making your plan?).
    - Was your plan discussed among the occupants/family?
    - Had you rehearsed or practiced your plan?
    - Did you have a back-up plan?
    - Were you responsible for dependents or pets or livestock?

    If yes, was provision made for them in the bushfire plan? If yes, what?

14. Before the January bushfire, what actions, if any, had you taken to protect your home and your family from bushfires?

15. In the 2 or 3 days before the fire, how concerned were you about the possibility of a bushfire actually threatening your home? (Did you talk to neighbours about this? Do you think that others living in this area had similar concerns about a possible bushfires?).

16. The fire threatened on a Sunday, Sunday 12 January. Can you think back to the day before the fire threatened (Saturday)? What fire danger weather predictions or warnings do you recall about the day the fire threatened? Did you do anything in particular to prepare for a possible bushfire in the next day or so?

17. On the day of the fire, walk me though what happened and why. INTERVIEWER: use the following probes as needed to make sure you get a comprehensive narrative of this householder's experiences during the course of the day of the fire:
    - When and how did you first find out that there was a bushfire threat? INTERVIEWER: INVITE DFES PERSON TO ASK ABOUT INITIAL WARNINGS. SMS/LANDLINE ALERTS? PHONE TREES? SOCIAL MEDIA?
    - Where were you at the time? (IF NOT AT HOME: Did you try to return? What happened?)
    - Did you try to find out more information about the fire? How?
    - What did you decide to do about the fire **initially**?

- Main reasons for your initial decision?
- What did you ultimately end up doing?
- Why did you decide to do that? IF the interviewee left, what was the TRIGGER TO LEAVE?
- How did it all work out?

18. CHECK: Impact of the fire: Loss/damage to property or possessions? Loss of pets, livestock?

19. Knowing what you know now about the fire, what if anything would you have wanted to do differently?

(Thank resident, leave sources of help sheet).

APPENDIX C: MUNDARING AREA BUSHFIRE 2014 RESEARCH TASKFORCE: INTERVIEW SUMMARY CHECKLIST

Name of Researcher:	Name of DFES member:

Recorder Number:_____ Folder Letter:____ File# _____ Date of Interview:……../……../2014

1. Street Address of Property:

_____

_____

****TEAM: Is the property inside or near the fire scar?** ☐ Yes ☐ Outside, near the edge ☐ No (300 metres + away).

Was it destroyed? ☐ Yes ☐ No. Any evidence of damage? ☐ Yes ☐ No

2. Previously interviewed about the January bushfire? ☐ NO ☐ Yes (details)

_____

3. Household composition on the day of the fire: Total number in household?_____

Main Interviewee: ☐ Male ☐ Female. Year Born?_____

☐ Single person living alone? ☐Partnered? ☐ Partnered with family?

HOUSEHOLD:

☐ Dependents 12 and under? _____ ☐Dependents 13 and over? _____

☐ Dependents Elderly / other?_____

☐ Person with a disability (physical, mental)? ____ Non english speaking?_____

Occupational status of the main interviewee

☐ Employed Full Time

☐ Employed Part Time
☐ Retired

☐ Home duties

☐ Unemployed
☐ Other_____

Does the household have pets/Livestock? ☐ NO ☐ YES
what?_____

(IF APPLICABLE:

Second interviewee: ☐ Male ☐ Female. Year Born?_____

Third interviewee: ☐ Male ☐ Female. Year Born?_____

**TEAM: Which of the following best describes the property?

☐ House on a standard sized residential block

☐ House on a large 'lifestyle' type block

☐ Farm or other agribusiness(specify)_____

☐ Other e.g., business, school (specify)_____

4. How long has the main interviewee lived at this address ?_____Years

5. Property Status? ☐ Principle residence ☐ Holiday/Weekend residence ☐ Investment property

6. Ownership of the property?

☐ Householder owns house without a mortgage

☐ Householder owns house with a mortgage

☐ Householder rents the house

☐ Householder manages property for absentee owner (house included in package)

7. Insurance House: ☐ Fully Insured ☐ Underinsured ☐ Have no insurance

Contents ☐ Fully Insured ☐ Underinsured ☐ Have no insurance

Other relevant
insurance/issues?_____

8. Past experience with bushfires? ☐ Yes ☐ No If Yes, Actively defended? ☐ Only observed? ☐

If Yes, when and where_____

9. Any of the household previously, or currently, a member of a Fire Brigade? ☐ Yes Current ☐ Yes Previous ☐

☐ No

10. What sort of community do they think it is?

- About how many people in your local community do you know?_____
- Do you think most of your neighbours know you? ☐ Yes ☐ No
- Do neighbours cooperate if there are safety issues in the area – say with bush or grass building up? ☐ Yes ☐ No
- Do you feel any sense of personal connection with your neighbours? ☐ Yes ☐ No
- Do you and your neighbours socialise much with each other? ☐ Yes ☐ No
- If you needed help, say with transport, could you easily get this from your neighbours? ☐ Yes ☐ No
- Participated in community bushfire safety activities? ☐ NO ☐ YES

If YES, which?

Community Activities

☐ Bushfire-ready Group

☐ Community Bushfire Street Meeting

☐ Shire of Mundaring Online Bushfire Exercise

☐ Other _____

11. Possible bushfire threat to home and family?

☐ Quite concerned

☐ Some concern

☐ slight concern

☐ No concern

☐ Never thought about it

Did neighbours have a similar attitude about bushfire risk?☐ Yes ☐ No

**INTERVIEW TEAM: about how far from the house is the nearest significant bushland? _____metres

12. Sources of bushfire safety information in the 12 months BEFORE the January bushfire?

☐ DFES Prepare. Act. Survive booklet

☐ DFES Home Owner's Bushfire Survival Manual

☐ Am I at Risk of Bushfire booklet

☐ DFES Website

☐ Friends/ Family/ Neighbours☐ Local Bushfire Brigade

☐ Bushfire Ready Group

☐ Shire Bushfire Safety material

☐ Other_____

13. Before the January bushfire: did they have a bushfire plan for what they would do if ever threatened by a bushfire?

☐ NO ☐ Yes IF YES, WHAT WAS IT?

☐ All stay and defend (unambiguous)

☐ **Some** people leave early, **others** stay and defend

☐ **Wait and see** how bad it is then decide

☐ **No** concrete plan

☐ Whole household **leaves**

Main reason for this plan:

_____

DFES Prepare. Act. Survive used? ☐ Yes ☐ No Home Owner's Bushfire Survival Manual used? ☐ Yes ☐ No

Was the plan written down? ☐ Yes ☐ No Was it discussed ☐ Yes ☐ No Was it practised ☐ Yes ☐ No

Did they have a backup plan ☐ No ☐ Yes
(Details)_____

Did they make provision for dependents in their bushfire plan? ☐ Yes ☐ No For Pets/animals? ☐ Yes ☐ No

14. Long-Term Bushfire Preparations (well before the 12 January fire)

☐ N/A No preparations

☐ A bushfire plan?

☐ Evacuation destination chosen?

☐ Organised safety of pets/livestock

☐ Evacuation route mapped out?

☐ A GO KIT of valuables prepared?

☐ Decided on the trigger to leave?

☐ Removed combustible material away from the house?

☐ area around house cleared of vegetation

☐ Other

_____

☐ Water supply independent of mains?

☐ Pump with power source independent of mains?

☐ Obtained suitable hoses for firefighting?

☐ Obtained suitable protective clothing?

☐ Sealed-off gaps and spaces to prevent embers igniting the house?

☐ Installed window protection?

☐ Installed a sprinkler system that could protect the house from embers?

15. Days <u>before</u> the 12 January bushfire:

Any special preparations for possible bushfire? ☐ NO ☐ YES
Discussed With Neighbours? ☐ NO ☐ YES

Comments_____

16. Recalled anything about fire danger rating predictions for Sunday 12 January? ☐ Yes ☐ No

Any preparatory actions taken on the Sunday BEFORE the bushfire warning**?**

☐ N/A – Not at home

☐ NO ☐ YES, if Yes, What?_____

17. Main interviewee's experiences on the day of the bushfire.

17a. How first found out there was a bushfire threat?

☐ Saw smoke

☐ Saw flames

☐ Emergency warning received on mobile phone

☐ Emergency warning received on landline

☐ ABC radio

☐ ABC television

☐ DFES Website

☐ Call from neighbours/friend

☐ DFES twitter feed

☐ Other twitter feed

☐ Other_____

17b.Was the main interviewee at home when he/she first became aware of the bushfire threat? ☐ Yes ☐ No

If NO, where?_____

17c. If person NOT at home, what did they do?

☐ Did NOT try to return home TOO FAR AWAY

☐ Did NOT try to return, decided too dangerous

☐ Tried to return, but prevented by road blocks (OR OTHER OBSTACLE:_____

☐ Returned, but later left

☐ Returned, stayed.

17c. Attempts to find out more information about the bushfire?

☐ DFES Website

☐ DFES Twitter

☐ Called DFES 1300 information number

☐ Called friends/neighbours

☐ ABC 720 website

☐ ABC TV News

☐ ABC Twitter Feed

☐ Other radio

☐ Other TV

☐ Other Facebook

☐ Other Twitter

☐ Visited fire ground

☐ Other_____

17d. What did they decide to do initially?

☐ All stay and defend

☐ **Some** people leave early, **others** stay and defend

☐ **Wait and see** how things develop then decide

☐ **No** concrete plan

☐ Whole household **leaves**

Main reason for this initial decision:

_____

__

17e. What did they finally decide? That is, their final decisive action

☐ All stayed and defended

☐ **Some** people left, **others** stayed

☐ All stayed but did not have to defend

☐ All stayed, sheltered passively

☐ All left

Did they help protect **neighbour's** house?

☐ Yes ☐ No ☐ N/A

Did neighbours help protect **their** house?

☐ Yes ☐ No ☐ N/A

Main reason for this final decision:

_____

__

17f. If they LEFT, what was the TRIGGER(S) TO ACTUALLY DECIDE TO LEAVE?

☐ Saw smoke

☐ Saw flames

☐ Emergency Alert message

☐ Advice from police/firefighters/SES

☐ Phone information from family/friends/neighbours

☐ Ordered to evacuate by police

☐ Media information/warnings

☐ Face-to-face advice/information from neighbours

☐ House prepared, nothing more to do

☐ Fire impacted on property

☐ Heard/saw aircraft

☐Other_____

18. Check: Any damage/loss?

☐ No damage: fire never really threatened the property

☐ Fire threatened but no damage ☐ Major damage

☐ Minor damage ☐ House was destroyed

Was anything else (e.g. shed, water tank, caravan or vehicle) damaged/destroyed? ☐ No ☐ Yes

If yes, what?_____

Did the bushfires injure or kill any pets livestock ☐ NO ☐ YES

If yes, Details:_____

19. Do anything differently? ☐ No ☐ Yes

IF YES, WHAT?_____

INTERVIEW TEAM:

To help the data analysts, please write a brief ‘abstract’ or summary of this householder’s account, noting anything of special interest:

APPENDIX D

Psychometric properties of the six-item Sense of Community Connectedness Index (SCCI):

Internal consistency reliability (Cronbach's α) = 0.70.

Concurrent convergent validity evidence: correlation between SCCI score and 'Yes' response to 'Did neighbours have a similar attitude (towards bushfire risk pre-fire)?' r_{pb} = 0.262, p = 0.02.

Concurrent discriminant validity evidence: correlation between SCCI score and length of time resident at property for those aged 70 years or less: r = 0.007, *not significant*. (The age restriction was to reduce possible effects of decline in social activity due to ageing).

APPENDIX E

The material presented here about percentage of householders in different intention groups reporting preparatory actions completed is from McLennan, Elliott and Wright (2014): *Bushfire survival preparations by householders in at-risk areas of south-eastern Australia.*

Preparation action	*Leave* *(n = 273)*	*Stay and defend* *(n = 139)*	*Wait and see* *(n = 172)*
***Bushfire Safety Planning*:**			
Prepared a plan involving all members of the household for what to do when a day of severe or worse fire danger weather is forecast or declared for your region	35%	56%	24%
Prepared a plan involving all members of the household for what to do when there is a warning that there is a bushfire threatening your home	39%	56%	24%
***Preparations for Leaving*:**			
Planned what to do if you decide to leave your home because of the risk of a bushfire (e.g. where to go and stay, the route to take, what to do about pets/livestock)	52%	62%	41%
Identified a location nearby where you, or other family members, could shelter safely if you had to leave your home because of a bushfire	61%	74%	61%
Checked that you have enough home contents and building insurances	87%	89%	86%
Stored important documents and possessions safely elsewhere, or in a fire-proof location on site, or have them packed ready to take with you when you leave	40%	38%	37%
Preparations for Active House Defence:			
Installed a pump that does not depend on mains electric power (i.e. petrol, diesel-driven or electrically powered by a generator)	20%	59%	19%
Installed a water tank for firefighting purposes and/or to supply a sprinkler system	32%	68%	30%
Obtained and prepared firefighting equipment such as ladders, buckets and mops	27%	75%	35%
Prepared a kit of protective clothing and gear (boots, smoke masks, goggles for members of the household)	21%	63%	22%
Obtained and prepared hoses long enough to reach all parts of the house	41%	75%	49%
Installed a sprinkler system on or around the house	8%	34%	14%
Obtained a battery-powered radio with fresh batteries	53%	76%	51%
Installed or constructed a fire shelter or bunker in which to take refuge if necessary	2%	12%	4%

Preparations for Reducing Danger to the House:			
Removed bushes close to the house and cut back overhanging tree branches	39%	68%	42%
Cleared leaves, twigs, long grass from around the house to a distance of 20–30 m	46%	69%	49%
Moved combustible material such as firewood, garden furniture, lawnmower fuel, paint tins, old cars or tyres away from the house	46%	69%	49%
Used landscaping, tree planting, or the layout of the garden to protect the house from bushfires	29%	59%	39%
Preparations for Reducing House Vulnerability:			
Enclosed under-floor spaces to prevent embers or flames from entering	48%	62%	60%
Covered gaps and vents to reduce the risk of embers entering the house through openings under the roof or in walls	30%	48%	30%
Installed seals and/or draft protectors around windows and doors	32%	46%	52%
Installed roof gutter protection	26%	40%	26%
Installed shutters for windows	1%	3%	3%

APPENDIX F

Summary of major finding from seven Bushfire CRC and BCRC post-bushfire interview studies.

Table A: Post-bushfire interview studies

Fires	*Predicted Fire Danger Ratings*	*Interviews conducted: total number those at home on the day of the fire*
February 2009, Victoria, Black Saturday	Extreme*	496 /457
January 2011, WA, Lake Clifton	High	40/36
February 2011, WA, Perth Hills	High	395/361
January 2013, Tasmania, SE Tasmania (Dunalley)	Catastrophic	245/217
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	Extreme–Catastrophic	238/212
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	Very High–Extreme	194/150
January 2014, WA, Parkerville	Extreme	91/80
Total		1,699/1,513

* Would now be 'Code Red'

Table B: Pre-fire bushfire risk perceptions

Fire	*% reporting some level of perceived bushfire risk*	*% reporting no perceived bushfire risk*
February 2009, Victoria, Black Saturday	89%	11%
January 2011, WA, Lake Clifton	93%	7%
February 2011, WA, Perth Hills	79%	21%
January 2013, Tasmania, SE Tasmania (Dunalley)	92%	8%
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	85%	15%
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	67%	33%
January 2014, WA, Parkerville	91%	9%

Unweighted average	85%	15%

Table C: Residents reporting a pre-fire bushfire plan

Fire	*% reporting a pre-fire bushfire plan*	*% reporting a written plan*
February 2009, Victoria, Black Saturday	78%	2%
January 2011, WA, Lake Clifton	80%	2.5%
February 2011, WA, Perth Hills	72%	not known
January 2013, Tasmania, SE Tasmania (Dunalley)	88%	4%
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	92%	9%
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	67%	7%
January 2014, WA, Parkerville	81%	8%
Unweighted average	80%	5.4%

Table D: Residents' pre-bushfire plan

Fire	*Leave*	*Stay and defend*	*Wait and see*	*No plan*
February 2009, Victoria, Black Saturday	24%	48%	6%	22%
January 2011, WA, Lake Clifton	65%	10%	5%	20%
February 2011, WA, Perth Hills	32%	20%	20%	28%
January 2013, Tasmania, SE Tasmania (Dunalley)	47%	26%	15%	12%
January 2013,	29%	34%	29%	8%

NSW (Coonabarabran, Yass, Shoalhaven)				
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	26%	28%	14%	32%
January 2014, WA, Parkerville	53%	20%	7%	19%
Unweighted average	40%	26%	14%	20%

Table E: Pre-bushfire plan by percentage of residents reporting a high level of preparation to implement their plan

Fire	*Planned to leave*[a]	*Planned to stay and defend*[b]
February 2009, Victoria, Black Saturday	8%	48%
January 2011, WA, Lake Clifton	6%	6%
February 2011, WA, Perth Hills	not known	not known
January 2013, Tasmania, SE Tasmania (Dunalley)	not known	not known
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	not known	not known
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	27%	17%
January 2014, WA, Parkerville	24%	70%
Unweighted average	16%	35%

[a] Had chosen a destination; had planned a route; had a kit packed ready to leave.

[b] Had a water supply independent of mains; had a power supply for a pump independent of mains electricity.

Table F: Percentage of residents interviewed who left for safety reasons on the basis of predicted fire danger, before any fire was reported

Fire	*Predicted Fire Danger Rating*	*% who left before the fire was reported*
February 2009, Victoria, Black Saturday	Extreme[a]	2%
January 2011, WA, Lake Clifton	High	0
February 2011, WA, Perth Hills	High	0
January 2013, Tasmania, SE Tasmania (Dunalley)	Catastrophic	1%
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	Extreme–Catastrophic	10%[b]
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	Very High–Extreme	1%
January 2014, WA, Parkerville	Extreme	0
Unweighted average/Median		2%/1%

[a] Would now be Code Red

[b] All from the Coonabarabran area.

Table G: Final actions of residents interviewed who were at home on the day of the fire

Fire	*Left*	*Stayed*
February 2009, Victoria, Black Saturday	48%	52%
January 2011, WA, Lake Clifton	81%	19%
February 2011, WA, Perth Hills	not known	not known
January 2013, Tasmania, SE Tasmania (Dunalley)	50%	50%
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	48%	52%
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	54%	46%
January 2014, WA, Parkerville	73%	27%
Unweighted average	59%	41%

Table H: Residents interviewed who were home on the day: percentage who implemented their pre-bushfire plan

Fire	*To leave – left*	*To stay – stayed*
February 2009, Victoria, Black Saturday	89%	80%
January 2011, WA, Lake Clifton	100%	75%
February 2011, WA, Perth Hills	not known	not known
January 2013, Tasmania, SE Tasmania (Dunalley)	not known	not known
January 2013, NSW (Coonabarabran, Yass, Shoalhaven)	not known	not known
October 2013, NSW (Blue Mountains, Port Stephens, Wingecarribee Shire)	89%	90%
January 2014, WA, Parkerville	91%	90%
Unweighted average	92%	84%