



COMMUNITY PREPAREDNESS AND RESPONSES TO THE 2017 NEW SOUTH WALES BUSHFIRES

Research for the New South Wales Rural Fire Service

Dr Josh Whittaker^{1,2} and Dr Mel Taylor^{1,3}

¹ Bushfire and Natural Hazards CRC

² University of Wollongong

³ Macquarie University

Email: wjoshua@uow.edu.au





Version	Release history	Date
1.0	Initial release of document	12/02/2018
1.1	Two sentences amended on page 103 to correct information in regards to the Stoney Creek Brigade and the NSW RFS Hotspots team.	20/02/2018



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme

All material in this document, except as identified below, is licensed under the Creative Commons Attribution-Non-Commercial 4.0 International Licence.

Material not licensed under the Creative Commons licence:

- Department of Industry, Innovation and Science logo
- Cooperative Research Centres Programme logo
- Bushfire and Natural Hazards CRC logo
- University of Wollongong logo
- Macquarie University logo
- New South Wales Government logo
- New South Wales Rural Fire Service logo
- All photographs, graphics and figures

All content not licenced under the Creative Commons licence is all rights reserved. Permission must be sought from the copyright owner to use this material.



Disclaimer:

The University of Wollongong, Macquarie University and the Bushfire and Natural Hazards CRC advise that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, The University of Wollongong, Macquarie University and the Bushfire and Natural Hazards CRC (including its employees and consultants) exclude all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

Publisher:

Bushfire and Natural Hazards CRC

ISBN: 978-0-6482756-0-2

February 2018

Citation: Whittaker J & Taylor M (2018) Community preparedness and responses to the 2017 New South Wales bushfires: Research for the New South Wales Rural Fire Service. Melbourne: Bushfire and Natural Hazards CRC

Cover: Firefighters and landholders responding to the Sir Ivan fire. Photo: Nick Moir, Fairfax Media.



TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
Background	4
Research scope and methods	4
Key findings	5
1. INTRODUCTION	10
2. BACKGROUND	11
2.1 The Currandooley fire	14
2.2 The Sir Ivan fire	17
2.3 The Carwoola fire	22
3. RESEARCH METHODS	25
3.1 Semi-structured interviews	25
3.2 Online survey	29
3.3 Ethics and fieldwork risks	30
4. FINDINGS	31
4.1 Effectiveness of warnings delivered to the community	31
4.2 Did warnings and information assist people to reduce risks to agricultural assets	40
4.3 Delivery of Catastrophic Fire Danger messages	46
4.4 Information sought out relating to the fires	56
4.5 Drivers and motivators for re-entering fire grounds	60
4.6 Perceptions of risk	65
4.7 Responses by the community and prioritisation of protective responses	73
4.8 Perceptions of risk to and value of agricultural assets vs. homes	90
4.9 Influences of previous fire history and experience on planning, preparedness and decisions	95
4.10 Identified intervention strategies	102
4.11 Public expectations of fire and emergency services	104
4.12 Local knowledge and participation	111
5. DISCUSSION AND CONCLUSIONS	114
REFERENCES	118
ACKNOWLEDGEMENTS	119
APPENDIX 1: INTERVIEW GUIDE	120
APPENDIX 2: INTERVIEW PARTICIPANT INFORMATION SHEET	122
APPENDIX 3: ONLINE SURVEY INSTRUMENT	124



LIST OF FIGURES

Figure 1: Extent and timing of the Currandooley fire	16
Figure 2: Extent and timing of the Sir Ivan fire	21
Figure 3: Extent and timing of the Carwoola fire	24
Figure 4: Age profile of the Currandooley interview sample (%)	26
Figure 5: Age profile of the Carwoola interview sample (%)	27
Figure 6: Age profile of the Sir Ivan interview sample (%)	27
Figure 7: Age profile of online survey respondents (%)	30
Figure 8: Response to Catastrophic Fire Danger warning (%)	47
Figure 9: Intended response to a Catastrophic Fire Danger warning next summer (%)	48
Figure 10: Intended response to a Catastrophic Fire Danger warning next summer, by gender (%)	49
Figure 11: Intended response to a Catastrophic Fire Danger warning next summer, by NSW RFS membership (%)	49
Figure 12: Intended response to Catastrophic Fire Danger warning next summer, by property type (%)	50
Figure 13: Words and phrases used by participants (%) when describing most useful social media source (n=143)	56
Figure 14: Perception of threat posed by bushfires to property, household member safety, and business or livelihood assets (%)	66
Figure 15: Perception of threat posed by bushfires to property, by property type (%)	67
Figure 16: Perception of threat posed by bushfires to household member safety, by property type (%)	67
Figure 17: Perception of threat posed by bushfires to business or livelihood assets, by property type (%)	68
Figure 18: Level of planning for bushfire (%)	73
Figure 19: How Guide to Making a Bushfire Survival Plan was used (%)	74
Figure 20: Information sources used to prepare a plan (%)	74
Figure 21: Household fire plan at the beginning of last summer	75
Figure 22: Household fire plan at the beginning of last summer, by property type (%)	76
Figure 23: Insurance coverage at the beginning of the season (%)	79
Figure 24: Perceptions of preparedness level (%)	80
Figure 25: Feelings about preparedness level (%)	80
Figure 26: Respondents' response to the bushfire (%)	82
Figure 27: Reasons for leaving house or property (%)	83
Figure 28: Intended and actual destination of those who left (%)	84
Figure 29: Perception of danger when leaving (%)	84
Figure 30: Difficulties experienced when leaving (%)	85
Figure 31: Difficulties experienced when returning (%)	85
Figure 32: Reasons for staying with house or property	87
Figure 33: Reasons those who stayed left (%)	89
Figure 34: Previous experience with bushfire (%)	96



LIST OF TABLES

Table 1: Demographic characteristics of ABS 'State Suburbs' affected by the bushfires (Census 2016)	12
Table 2: Coding framework for analysis of interview transcripts	28
Table 3: Survey respondents' assessments of official warnings (in percentages)	31
Table 4: Assessments of official warnings (%) - house on large farm property	41
Table 5: Assessments of official warnings (%) - hobby farm or small acreage	42
Table 6: Actions taken to prepare house and property	78
Table 7: Insurance coverage at beginning of fire season	79
Table 8: Confidence when staying at house or property	88
Table 9: Measures of planning and preparedness (%), by fire experience	97



EXECUTIVE SUMMARY

BACKGROUND

January and February 2017 saw a number of destructive bushfires in New South Wales, some of which occurred during Catastrophic fire weather conditions. These fires damaged and destroyed a range of assets including houses, outbuildings, community halls, livestock, machinery, fences and other agricultural assets. Fortunately no human lives were lost.

RESEARCH SCOPE AND METHODS

The NSW Rural Fire Service (NSW RFS) commissioned the Bushfire and Natural Hazards Cooperative Research Centre to undertake research into community preparedness and responses to bushfires in NSW in 2017. The University of Wollongong and Macquarie University were engaged by the Bushfire and Natural Hazards CRC to conduct this research. The NSW RFS Statement of Work identified the following themes for investigation:

Theme 1: Information and warnings

- The effectiveness of warnings delivered to the community during fire events and the resulting actions taken
- Did the warnings and information provided assist people to reduce the risk to agricultural assets?
- The delivery of Catastrophic fire danger messages to areas which were not impacted by fire, to investigate whether this may have an effect on future responses during fire events
- How people sought out information relating to the fires
- What were the drivers and motivators for those people who sought to re-enter fire grounds? What was their perception of the risks associated with doing so?

Theme 2: Planning and preparedness measures

- An understanding of the perception of risk, particularly in the farming communities affected by fires
- Responses by the community and how people prioritised their protective responses (such as livestock, machinery and housing)
- The perception of risk to and value of agricultural assets vs homes
- What influence previous fire history had on their planning, preparedness and decisions
- Identified intervention strategies
- What information or advice people sought out in the lead up to the specific fire event



Investigation and analysis of firefighting responses and building impact assessments are outside the scope of this research.

The research involved 113 interviews with people affected by the Currandooley (n=36), Carwoola (n=38) and Sir Ivan (n=39) fires and an online survey of people (n=549) threatened or affected by bushfires throughout NSW in 2017. Survey results should be interpreted with caution due to biases associated with self-selected (non-random) samples.

KEY FINDINGS

Warnings

Key insight – A majority of survey respondents found warnings easy to understand, up-to-date and useful. Survey respondents and interview participants expressed a preference for highly localized information.

- Survey respondents most often identified Fires Near Me as their most useful information source. Fires Near Me was seen as easy to understand (88%), useful (82%) and sufficiently localised (76%). Two-thirds (66%) felt the information was up-to-date. Interviewees commonly expressed strong support and a high degree of satisfaction with Fires Near Me.
- Compared to SMS warnings, landline telephone warnings were more often seen as useful (78% v 67%), up to date (72% v 66%) and timely (68% v 66%). Nevertheless, survey respondents most often identified SMS as their preferred mode for delivery of warnings. Most people expect to receive warnings from multiple sources.
- Limited mobile phone coverage, particularly in the Sir Ivan and Currandooley fires, meant that some people did not receive SMS warnings.

Catastrophic Fire Danger warnings

Key insight – Most people do not intend to leave before there is a fire on days of Catastrophic Fire Danger. Those who intend to leave will wait until there is a fire, and others intend to stay and defend.

- Survey respondents considered Catastrophic Fire Danger warnings to be easy to understand (88%), timely (83%) and useful (78%).
- Receipt of an official warning about Catastrophic Fire Danger prompted survey respondents to discuss the threat with family, friends or neighbours (63%) and look for information about bushfires in their area (62%). Equal proportions began preparing to defend (39%) or leave (39%) and a smaller proportion (12%) left for a place of safety.
- When asked what they would do if they received a message about Catastrophic Fire Danger next summer, 12% said they would leave before there is a fire and 24% said they would wait until a fire started, then leave. 27% reported that they would get ready to stay and defend, while 24% said they would wait for a fire before deciding what to do.



- Analysis of interview data highlights that many people believe it is impractical to leave on days of Catastrophic Fire Danger before there is a fire. Many are also committed to defending, despite being aware of the increased risks to life on such days.

How people accessed information

Key insight – In addition to internet, social media and other sources, people sought information about the fire itself through direct observation. Observing the fire appears to have helped people ready themselves to defend, or confirmed the need to leave.

- Half of all respondents accessed information via the internet (53%). They most commonly sought information about the location of the fire (91%), roads (e.g. traffic and road blocks) (64%) and weather conditions (60%). Around half looked for information about firefighting activities (54%) and the likely time of impact (43%). Websites most commonly used included Fires Near Me, the NSW RFS, Bureau of Meteorology and various Facebook pages (including NSW RFS and local community pages). Almost two-thirds (62%) of all survey respondents used social media during the fires.
- Interviewees and survey respondents often sought information about the fire through direct observation. Consistent with findings from past research, many residents left their homes and properties to go and look at the fire. For some people, observing the fire appears to have helped ready themselves to defend and, for others, confirmed the need to leave.

Drivers and motivators for returning

Key insight – The need to protect houses and property, rescue or assist vulnerable people, and protect animals are the main drivers for returning. Some interviewees passed through road blocks, or circumvented them, to return home.

- The majority of survey respondents were at home when they found out about the bushfire (60%). Of those who were not at home, 71% indicated that they tried to return to their house or property.
- The drivers for returning to fire affected areas are many, but most often revolve around the desire to protect houses and property, rescue or assist vulnerable people, and protect animals.
- While some interviewees complied with roadblocks, others described passing through or circumventing roadblocks in order to return. Some interviewees used backroads or gates through private property to return, sometimes on foot or in vehicles that were unsuitable for roads, tracks and paddocks. There was a perception that some people were exposed to more danger than if they had passed through the roadblock.

Perceptions of risk

Key insight – Some people may underestimate the risks to life and property if fire danger is not Catastrophic.



- Analysis of interviews with people affected by the Carwoola and Currandooley fires suggests that some may have underestimated the risks to life and property because fire danger conditions were not Catastrophic.
- Many interviewees affected by the Sir Ivan fire did not anticipate the size or severity of the fire. References to experience with smaller fires were common. Many felt that they were prepared to respond to smaller, 'normal' fires, but there was little they could have done to prepare for a fire of the size and severity of Sir Ivan.

Prioritisation of protective responses

Key insight – Many hobby farms, small acreages and large farm properties were significantly underinsured. Interviewees often discussed prioritisation of insurance, with many seeing insurance as cost-prohibitive.

- 48% of survey respondents left or were away from their house or property during the fire; 47% stayed to defend; and 6% sheltered inside a house or somewhere outside. Those who left prioritised the protection of life, even if that meant losing a house or property: 48% left because they felt it was too dangerous to stay; 33% left to remove household members or visitors from danger; and 31% left because it was a day of high fire danger. Those who stayed usually did so to protect property, and most (81%) did not feel their life was endangered at any point. Common reasons for staying were to protect the house and property (63%) and to protect livestock and other animals (43%).
- Rates of house insurance were high for houses on residential blocks, hobby farms/small acreages and large farm properties (all 92%). However, only half of all large farms and hobby farms/small acreages were fully insured (55% and 47% respectively). Affordability of insurance was an issue for many agricultural landholders. Interviewees discussed their decisions to insure some assets but not others. Insuring fences and livestock were seen as particularly cost-prohibitive.

Perception of risk to and value of agricultural assets vs homes

Key insight - Perceptions of value and risk to agricultural and domestic assets are complex. Economic value is important in decisions about what to protect, but is balanced against utility and sentimental values.

- Many farm properties were large with a wide distribution of assets. Some landholders also had additional blocks that came under threat. They often did what they could to prepare, for example by ploughing fire breaks and moving livestock, then fell back to protect what was manageable, typically the house and nearby paddocks and sheds. This appears to have been based on an assessment of what was possible with available resources and not necessarily what was valued most.
- Although there may be more financially valuable assets than houses, homes often have utility values that exceed their direct financial worth. For example, one farmer explained how the houses on his large farm property provided accommodation for workers, without which the



business would be unable to re-establish. Houses also have sentimental or emotional values that also influence the prioritisation of protective responses.

Public expectations of the NSW RFS

Key insight – While limitations to NSW RFS support due to resource constraints are generally well understood (e.g. there are not enough fire trucks for every property), there is less appreciation of operational constraints imposed by Fire Danger conditions, fire behaviour and health and safety obligations.

- Most interviewees affected by the Currandooley and Carwoola fires praised the efforts of firefighters and did not expect to receive personal firefighting support. Residents in Carwoola were particularly cognisant of the limits to NSW RFS support, which had been clearly communicated by the local brigade over time.
- Some interviewees affected by the Sir Ivan fire were critical of the firefighting response. It is important to recognise that these criticisms reflect interviewees' personal views and, whether they are factual or not, or warranted or not, they provide insights into people's understandings of firefighting and their expectations of the NSW RFS and other emergency services. Criticisms varied in detail but typical reflected a belief that the NSW RFS prioritised the protection of houses over agricultural properties and assets; and that firefighting strategy was bureaucratic, directed from afar, and overly risk averse. These criticisms should also be viewed in the context of a large, destructive bushfire that burnt under Catastrophic conditions.

Implications and opportunities

The findings presented in this report have numerous implications and present opportunities for NSW RFS communications and community engagement. These include:

- The research confirms the tendency for people to observe the fire directly to ready themselves to defend or confirm the need to leave. This behaviour presents opportunities for emergency service personnel to meet people at a time when they are seeking and receptive to information and advice. Such meetings could occur at locally known observations points, or at locations designated by emergency services.
- There is a need to more clearly communicate the risks posed by fires burning under non-Catastrophic Fire Danger conditions. Such messages could be incorporated into community education and engagement resources, as well as emergency warnings and information.
- There is potential to develop additional resources to assist agricultural landholders to plan and prepare for bushfire. Resources are needed to help businesses more systematically identify assets and values, prioritise, and plan for their protection. These materials could include 'Best practice' case studies and information about insurance.



- There is a need to more clearly communicate the limits to NSW RFS response capacity. In addition to limitations due to resource constraints, which are generally well-understood, there is potential for enhanced communication of operational constraints imposed by Fire Danger conditions, fire behaviour and associated imperatives such as Occupational Health & Safety requirements. Findings suggest that local brigades can be effective in communicating these messages; however, this may require considerable engagement and training at a time when some NSW RFS members are finding training and time commitments challenging.



1. INTRODUCTION

January and February 2017 saw a number of destructive bushfires in New South Wales, some of which occurred during Catastrophic fire weather conditions. These fires damaged and destroyed a range of assets including houses, outbuildings, community halls, livestock, machinery, fences and other agricultural assets. Fortunately no human lives were lost.

The NSW Rural Fire Service engaged the Bushfire and Natural Hazards CRC to conduct research into community preparedness and responses to bushfires in NSW in 2017. The NSW RFS identified two main themes for investigation. The first theme, Information and warnings, comprised a series of questions about the effectiveness of warnings delivered to the community, the delivery of Catastrophic Fire Danger messages, the information people sought out relating to the fires, and the drivers and motivators for those who sought to enter or re-enter fire grounds. The second theme, Planning and preparedness measures, encompassed questions about people's perceptions of bushfire risk, perceptions of risk to and value of agricultural and domestic assets, prioritisation of protective responses, and influences of previous fire history.

The research involved 113 interviews with people affected by the Currandooley, Carwoola and Sir Ivan bushfires and an online survey of 549 people threatened or affected by bushfires in NSW in 2017. Ethics approval for the research was obtained from the University of Wollongong's Human Research Ethics Committee (Ethics Number 2017/216).

The following sections provide a background to the research, including detail of the fires under investigation and affected communities, outline the purpose and scope of the research, and detail the methods that were used to undertake the research. Research findings from the online survey and interviews are then presented for each theme and sub-theme, followed by a discussion of possible implications and opportunities for bushfire risk management in NSW.



2. BACKGROUND

This section provides an overview of the Currandooley, Sir Ivan and Carwoola fires and the communities they affected. Table 1 outlines key social and demographic variables for each ABS 'State Suburb' (SSC) within the affected areas.



Table 1: Demographic characteristics of ABS 'State Suburbs' affected by the bushfires (Census 2016)

	Currandooley		Carwoola	Sir Ivan					
	Tarago SSC	Mount Fairy SSC	Carwoola SSC	Dunedoo SCC	Leadville SSC	Uarbry SSC	Cassilis SSC	Coolah SSC	NSW
Population	426	205	1428	1221	169	49	304	1290	7,480,228
Private dwellings	184	93	532	649	80	24	180	617	3,059,599
Unoccupied private dwellings (%)	19.3	14.9	8.1	21.5	14.8	-	27.5	20.3	9.9
Median age	44	47	45	49	47	53	42	46	38
Male/female (%)	52.1 / 47.9	53.6 / 46.4	53 / 47	49.7 / 50.3	55.8 / 44.2	60 / 40	51.3 / 48.7	50.6 / 49.4	49.3 / 50.7
Couple family no children (%)	45.4	50.8	46.8	50	51.6	-	49.5	50.3	36.6
Couple family with children (%)	40.3	36.5	46.8	33.6	48.4	-	34.4	36.8	45.7
English-only language household (%)	87.1	95.4	87.2	83.9	71.2	-	95	87.7	68.5
Bachelor degree level or above (%)	17	25.2	27.5	7.6	8.9	-	9.6	10.7	23.4
Median weekly household income	\$1645	\$1875	\$2630	\$871	\$850	\$724	\$1101	\$975	\$1486
Property owned outright (%)	39.7	37	43	48.2	46.9	-	48.4	42.3	32.2
Property owned with mortgage (%)	43.4	57.5	46.3	20.8	24.5	-	14.8	24.2	32.3
Property rented (%)	14	5.5	8.7	28.1	16.3	-	29.5	29.7	31.8



Voluntary work (%)	25.6	28.4	25.8	29.2	30.9	-	34.6	28.5	18.1
Internet not accessed from dwelling (%)	19	11.1	6.4	33.3	40.8	-	19	24.4	14.7
Index of Relative Socio-Economic Advantage and Disadvantage (decile) (2011 data)	7	10	10	3	5	-	4	3	-
'Dropping of the edge' ranking	Disadvantaged	Disadvantaged	Advantaged	Disadvantaged	Disadvantaged	Disadvantaged	Disadvantaged	Disadvantaged	-



2.1 THE CURRANDOOLEY FIRE

Taylors Creek and Mount Fairy are located approximately 40km northeast of Canberra, in New South Wales. The area is mostly comprised of large farm properties, hobby farms, small acreages and rural residential blocks. Taylors Creek is part of the Australian Bureau of Statistics (ABS) Tarago State Suburb (SSC) in the Goulburn-Mulwaree Local Government Area (LGA). The Mount Fairy SSC is in the Queanbeyan-Palerang LGA.

Tarago SSC demographic profile

At the 2016 Census, the population of the Tarago SCC was 426. There were 184 private dwellings, 19% of which were unoccupied. The median age in Tarago (44) was slightly higher than that for the State of New South Wales (38). The proportion of households comprising couples without children (45%) was higher than that for NSW as a whole (37%). Most residents were born in Australia (81%; compared to 66% for NSW) and spoke only English at home (87% v. 69%). The proportion of residents attaining a Bachelor Degree level or above was slightly lower than for NSW (17% v. 23%). The median weekly household income was higher than for NSW as a whole (\$1645 v. \$1486). One in five households did not access the internet from their dwelling (19%). The Tarago SSC is the seventh decile¹ for the Australian Bureau of Statistics' Index of Relative Socio-Economic Advantage and Disadvantage Socio-Economic Indexes for Areas (SEIFA) decile, meaning that in 2011 it was within the highest 30% of areas in terms of socio-economic advantage. Nevertheless, the more recent 'Dropping Off the Edge' Report (Vinson and Rawsthorne 2015), which uses a broader range of indicators of socio-economic advantage and disadvantage, classifies the Tarago SSC as 'disadvantaged'.

Mount Fairy SSC demographic profile

At the 2016 Census, the population of the Mount Fairy SCC was 205. There were 93 private dwellings, 15% of which were unoccupied. The median age in Mount Fairy (47) was higher than that for the State of New South Wales (38). The proportion of households comprising couples without children (51%) was higher than that for NSW as a whole (37%). Most residents were born in Australia (83%; compared to 66% for NSW) and spoke only English at home (96% v. 69%). The proportion of residents attaining a Bachelor Degree level or above was slightly higher than for NSW (25% v. 23%). The median weekly household income was higher than for NSW as a whole (\$1875 v. \$1486). One in ten households did not access the internet from their dwelling (11%). The Mount Fairy SSC is the tenth decile of the ABS Index of Relative Socio-Economic Advantage and Disadvantage, meaning that in 2011 it was within the highest 10% of areas in terms of socio-economic advantage. Nevertheless, the more recent 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015) classifies the Tarago SSC as disadvantaged.

¹ Deciles divide a distribution into ten equal groups. In the case of SEIFA, the distribution of scores is divided into ten equal groups. The lowest scoring 10% of areas are given a decile number of 1, the second-lowest 10% of areas are given a decile number of 2 and so on, up to the highest 10% of areas which are given a decile number of 10.



The fire

The Currandooley fire is suspected to have begun shortly before 10am on Tuesday 17 January when a bird ignited from contact with high voltage powerlines and landed in dry grass in Tarago, NSW, approximately 40km north west of Canberra (See Table 2). 17 January was a day of Total Fire Ban for the Queanbeyan-Palerang and Goulburn Mulwaree LGAs. At 9am the temperature at the nearby Canberra weather station was 23.4°C, with westerly winds to 4kph and relative humidity of 59%. By 3pm the temperature had climbed to 36.9°C, with westerly winds to 28kph and relative humidity of 22%. The forecast fire danger rating was Severe.

The fire is alleged to have begun in the vicinity of pole number 25 of the WOO 33kV transmission powerline. By 10am, fire services were responding to the fire, which was approximately 5 hectares in size and spreading in an easterly direction toward Tarago Road. Firefighters took the opportunity to directly attack the fire while conditions were relatively mild, working from the flanks towards the head of the fire. By 1pm conditions had worsened and the fire was burning under Very High fire danger conditions. The fire had jumped Tarago Road and was burning towards properties in Mt Fairy Road, Sandhills Road and Hazeldell Road. Around 1.30pm the fire was at alert level 'Watch and Act' and an Emergency Alert was issued to advise residents of a bush and grass fire burning in the Taylors Creek Road area. Twenty minutes later it was upgraded to alert level 'Emergency Warning'.

By 2.30pm the fire had grown to almost 2000 hectares in size and was burning under Severe fire danger conditions. Additional firefighting appliances and personnel were deployed to the fire and property protection became the primary focus. The fire burned through private property throughout the afternoon, primarily affecting residents in the Tarago and Mount Fairy areas. At 5pm a Section 44 (relating to the control of the fire under the Rural Fires Act 1997) was declared for Queanbeyan-Palerang LGA and affected parts of the Goulburn Mulwaree LGA. By this time, the fire was impacting on properties in Barnet Drive. Weather conditions eased during the afternoon and early evening and by 7pm the fire was burning under Very High fire danger conditions. By 10.30pm the fire's rate of spread had slowed considerably.

Despite Very High fire danger conditions during the morning of Wednesday 18 January, firefighters managed to contain the fire shortly after midday. On Wednesday 1 February the fire was officially declared 'Out'. It had burned 3,378 hectares of land and destroyed one house, sheds, two vehicles, fences, pasture and estimated 200 sheep and cattle.

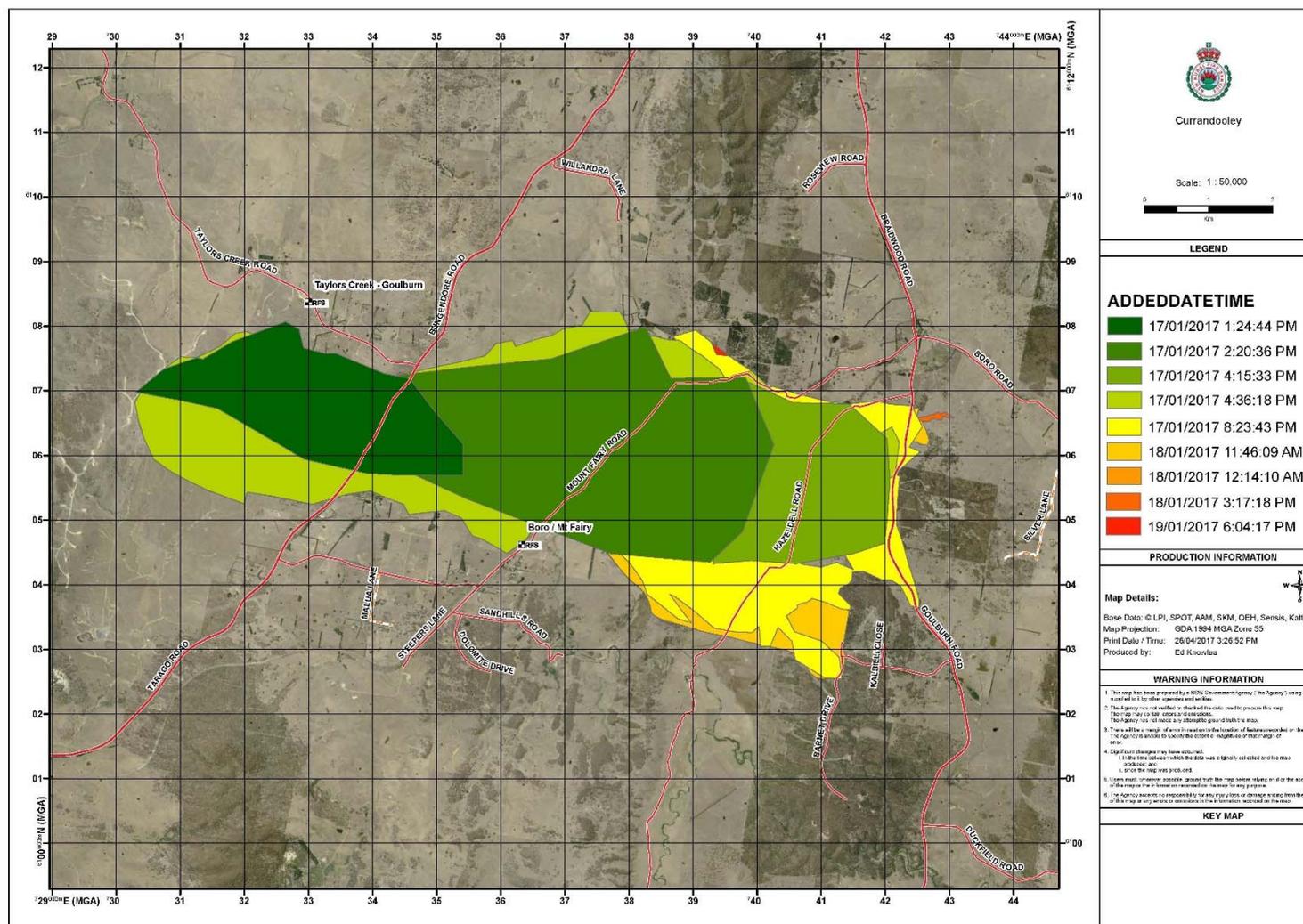


Figure 1: Extent and timing of the Currandooley fire



2.2 THE SIR IVAN FIRE

The areas affected by the Sir Ivan fire are located approximately 250km north west of Sydney in New South Wales. The area is comprised of large farm properties, smaller rural landholdings and residential blocks in and around the towns of Leadville, Dunedoo, Uarbry, Cassilis and Coolah. Large farm properties are predominantly cropping and cattle grazing enterprises. Leadville, Dunedoo, Uarbry and Coolah are within the Warrumbungle LGA and Cassilis is within the Upper Hunter Shire LGA.

Dunedoo SSC demographic profile

At the 2016 Census, the population of the Dunedoo SCC was 1221. There were 649 private dwellings, 22% of which were unoccupied. The median age in Dunedoo (49) was higher than that for the State of New South Wales (38). The proportion of households comprising couples without children (50%) was higher than that for NSW as a whole (37%). Most residents were born in Australia (77%; compared to 66% for NSW) and spoke only English at home (84% v. 69%). The proportion of residents attaining a Bachelor Degree level or above was lower than for NSW (8% v. 23%). The median weekly household income was significantly lower than for NSW as a whole (\$871 v. \$1486). One third of all households did not access the internet from their dwelling (33%). The Dunedoo SSC is in the third decile of the ABS Index of Relative Socio-Economic Advantage and Disadvantage, meaning that in 2011 it was within the highest 30% of areas in terms of socio-economic disadvantage. It is classified as disadvantaged in the 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015).

Leadville SSC demographic profile

At the 2016 Census, the population of the Leadville SCC was 169. There were 80 private dwellings, 15% of which were unoccupied. The median age in Leadville (47) was higher than that for the State of New South Wales (38). The proportion of households comprising couples without children (52%) was higher than that for NSW as a whole (37%). Leadville had a greater proportion of residents who were not born in Australia than other SSCs within the study area: 68% were born in Australia, compared to 66% for NSW. 71% of residents spoke only English at home. The proportion of residents attaining a Bachelor Degree level or above was lower than for NSW (9% v. 23%). The median weekly household income was significantly lower than for NSW as a whole (\$850 v. \$1486). 41% of households did not access the internet from their dwelling; the lowest rate of household internet use within the study areas. The Leadville SSC is in the fifth decile of the ABS Index of Relative Socio-Economic Advantage and Disadvantage. It is classified as disadvantaged in the 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015).

Uarbry SSC demographic profile

At the 2016 Census, the population of the Uarbry SCC was 49 and 24 private dwellings. The median age in Uarbry was 53 and median weekly household income was \$724. The ABS does not release more detailed demographic data for such small areas to ensure confidentiality. Uarbry is classified as



disadvantaged in the 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015).

Cassilis SSC demographic profile

At the 2016 Census, the population of the Cassilis SCC was 304. There were 180 private dwellings, more than a quarter of which (28%) were unoccupied. The median age in Cassilis (42) was slightly higher than for the State of New South Wales (38). The proportion of households comprising couples without children (50%) was higher than that for NSW as a whole (37%). 89% were born in Australia, compared to 66% for NSW, and most spoke only English at home. The proportion of residents attaining a Bachelor Degree level or above was lower than for NSW (10% v. 23%). The median weekly household income was significantly lower than for NSW as a whole (\$1101 v. \$1486). 19 % of households did not access the internet from their dwelling. The Cassilis SSC is in the fourth decile of the ABS Index of Relative Socio-Economic Advantage and Disadvantage, meaning that in 2011 it was within the highest 40 % of areas in terms of socio-economic disadvantage. It is classified as disadvantaged in the 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015).

Coolah SSC demographic profile

At the 2016 Census, the population of the Coolah SCC was 31290. There were 617 private dwellings, one fifth of which (19%) were unoccupied. The median age in Coolah (46) was higher than for the State of New South Wales (38). The proportion of households comprising couples without children (50%) was higher than that for NSW as a whole (37%). 83% were born in Australia, compared to 66 % for NSW. 88 % of residents spoke only English at home. The proportion of residents attaining a Bachelor Degree level or above was lower than for NSW (11% v. 23%). The median weekly household income was significantly lower than for NSW as a whole (\$975 v. \$1486). 24 % of households did not access the internet from their dwelling. The Coolah SSC is in the third decile of the ABS Index of Relative Socio-Economic Advantage and Disadvantage, meaning that in 2011 it was within the highest 30 % of areas in terms of socio-economic disadvantage. It is classified as disadvantaged in the 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015).

The fire

Saturday 11 and Sunday 12 of February 2017 were days of Total Fire Ban throughout NSW (see Table 3). Sunday was expected to bring particularly difficult conditions, with Catastrophic fire danger conditions forecast for the Central Ranges, North Western and Greater Hunter fire areas. At 8am on Saturday 11 February a pre-emptive Section 44 was declared for the Warrumbungle and Gilgandra local government areas. Emergency services received a Triple Zero call at 12:18 reporting the presence of a fire at Leadville. At this stage the fire was approximately 20 hectares in size but was not directly threatening life or property. 5 firefighting appliances and 10 personnel were on the scene.

Around 1:30 on Saturday conditions were worsening and police were advising people in the immediate area to consider evacuating and moving livestock. Water bombing aircraft were attacking the head of the fire and landholders with



private firefighting units were also actively fighting the fire. Emergency services received a Triple Zero call shortly before 2pm from a resident whose house was under immediate threat. By 2:20pm the temperature had reached 42°C with south-south-westerly winds to 47kph and relative humidity of 25%. A Situation Report at 15:31 indicated that the fire had grown to 407 hectares in size, with 12 firefighting appliances and six aircraft attacking the fire and engaging in property protection where required. By 16:37 more firefighting appliances, personnel and heavy plant had joined the operation, supported by a Large Air Tanker (LAT) and a Very Large Air Tanker (VLAT) which were working on identified drop zones. By 18:30 the fire was being controlled and was 874 hectares in size. Firefighters noted that high fuel loads in grass areas were making direct attack difficult. Firefighters and local landholders worked throughout the night to establish containment lines and commence back burns ahead of wind and temperature increases forecast for Sunday 12 February.

By 8:45am on Sunday 12 February the temperature was 36°C with light westerly winds at 6kph and relative humidity at 20%. Protection of life – both firefighters and the public – was identified as the primary objective in addition to heavy attack on new ignitions. Overnight, planning had focused on threats to life and property in the afternoon, particularly at Cassilis, Uarbry, Turill and Leadville. By mid-morning the Golden Highway was closed. A spot-over occurred in grassland, with firefighters engaging in direct attack, supported by aircraft. At 10:51 the temperature had climbed to 40°C, with westerly winds increasing to 26kph and relative humidity dropping to 13.5%. The fire quickly became uncontrollable.

An Emergency Warning was issued at 11:41 advising residents that there was a fire to the east of Dunedoo that was burning in Catastrophic conditions. Residents were advised to leave now if their path was clear and head for Cassilis. Ground firefighting crews were subsequently directed to move to safe locations. Shortly before midday the fire crossed the Golden Highway and at 12:43 residents in the vicinity of Ulan were issued an Emergency Warning advising them of a bushfire east of Dunedoo that was burning in Catastrophic conditions. They were advised to leave now if their path was clear and head south to Mudgee. There were multiple reports of properties under direct threat and confirmation that a house had been destroyed. At 12:48pm the Incident Controller advised firefighters to expect very erratic fire behaviour and directed all crews to operate at all times from a safe place only.

Between 1pm and 1.30pm there were multiple reports of properties under direct threat and properties being impacted by fire. Firefighting crews were engaged in property protection at numerous properties. At 1.38pm an Emergency Warning was issued to people (136 phone numbers) to the west of Cassilis advising them of a bushfire burning under Catastrophic conditions east of Dunedoo. The warning advised that it was too late to leave and that people should protect themselves from the heat of the fire by sheltering in a solid structure like a home (and not to be in the open). A Situation Report shortly before 2pm indicated that the fire had grown to 8,583 hectares in size. At 2.39pm an Emergency Alert was issued to 3,927 phone numbers, advising of a bushfire east of Dunedoo and that leaving immediately toward Merriwa was the safest option. By 3pm the temperature had reached 44.2°C with westerly winds to 44kph and relative humidity at 9.3%. A south westerly wind change was forecast and expected to impact at 4:30pm.



The south westerly wind change arrived early than expected, necessitating an Emergency Warning being issued for the Leadville area around 3:45pm. Emergency services were also door knocking in the area, advising residents to leave in the direction of Dunedoo, if their path was clear. Between 4:26pm and 4:45pm there were multiple reports of fire activity and threats to property in the vicinity of Tongy Lane and Ulan Road. At 4:50pm the Bureau of Meteorology advised that the fire had created a pyro-cumulonimbus storm could 14km high. Firefighters were issued with a safety warning to ensure that they were working from safe ground at all times and were advised to expect lightning, high winds and increased spotting when the pyro-cumulonimbus cloud collapses. At 5pm south-south westerly winds were gusting to 80kph. Emergency Warnings were issued for the western area of Leadville at 5:21pm, advising that it was too late to leave and to seek shelter, and for those between Dunedoo and Binnaway at 6:36pm, advising that leaving in the direction of Dunedoo or Mendooran is the safest option, if the path is clear. At 6:44pm a Situation Report indicated that the fire was 25,702 hectares in size. There were 30 appliances and 98 personnel responding with the support of 13 aircraft. By 8pm the effects of the pyro-cumulonimbus storm were easing.

The fire continued to burn under reduced fire danger conditions in the days after Sunday 12 February. It was contained on Thursday 16 February and was officially declared 'Out' on Friday 3 March. The fire had burned 55,372 hectares of land and destroyed 35 houses, 131 outbuildings, a church and a community hall. The fire caused significant losses of agricultural assets including livestock, fences, pasture and machinery.

The fire caused significant distress and discontent among some community members affected by the fire. Some believed that communication between the NSW RFS incident managers and those on the ground was inadequate, and that an overly risk averse approach prevented firefighters from assisting some landholders.² Some of these issues, where they fall within the scope of this research, are addressed in Section 4.

² See for example: 'Call for Coronial Inquiry into devastating Sir Ivan bushfire' at <https://www.singletonargus.com.au/story/4803529/nsw-farmers-association-calls-for-coronial-inquiry-into-sir-ivan-bushfire/> and 'I've never felt as alone': RFS 'playing cricket' as property burned' at <http://www.centralwesterndaily.com.au/story/4488657/ive-never-felt-as-alone-rfs-playing-cricket-as-property-burned>

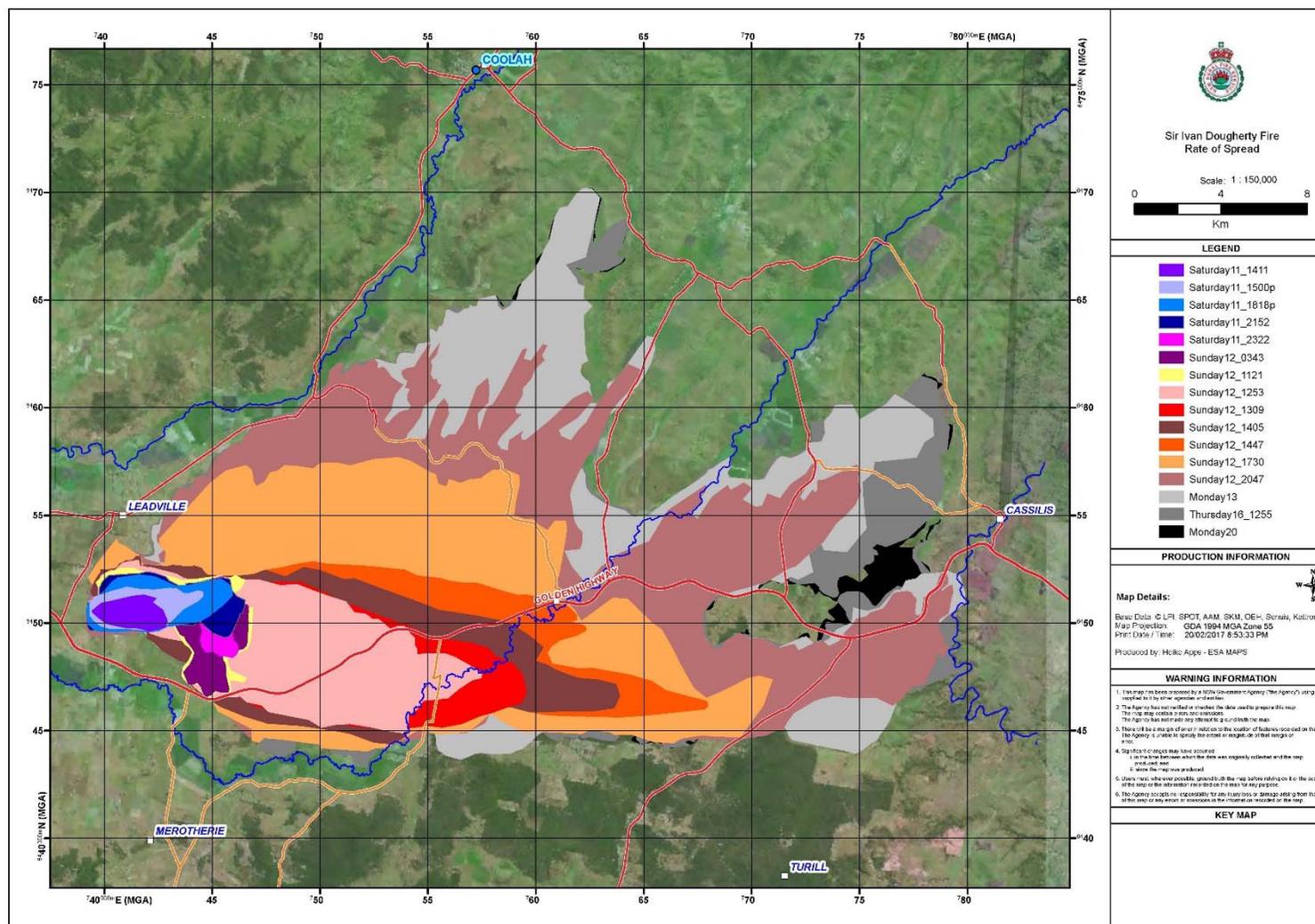


Figure 2: Extent and timing of the Sir Ivan fire



2.3 THE CARWOOLA FIRE

Carwoola is located approximately 20km southeast of Canberra, in New South Wales. The area is mostly comprised of hobby farms, small acreages and rural residential blocks, although some large farm properties remain. The Carwoola SSC is within the Queanbeyan-Palerang LGA.

Carwoola SSC demographic profile

At the 2016 Census, the population of the Carwoola SCC was 1428. There were 532 private dwellings, 8 % of which were unoccupied. The median age in Carwoola (45) was higher than that for the State of New South Wales (38). The proportion of households comprising couples without children (47%) was higher than that for NSW as a whole (37%). Most residents were born in Australia (79%; compared to 66% for NSW) and spoke only English at home (87% v. 69%). The proportion of residents attaining a Bachelor Degree level or above was higher than for NSW (28% v. 23%). The median weekly household income was significantly higher than for NSW as a whole (\$2360 v. \$1486) and all of the other SSCs within the study areas. Only 6 % of households did not access the internet from their dwelling. The Carwoola SSC is the tenth decile of the ABS Index of Relative Socio-Economic Advantage and Disadvantage, meaning that in 2011 it was within the highest 10% of areas in terms of socio-economic advantage. It is the only SSC within the three areas that is classified as advantaged in the 'Dropping Off the Edge' report (Vinson and Rawsthorne 2015).

The fire

Friday 17 February was a day of Total Fire Ban for the Southern Ranges Fire Area. Shortly before midday, emergency services received a Triple Zero call reporting a grass fire in Taliesen Road, Carwoola. It was later found that the fire had ignited from sparks caused by a metal cutting wheel being used on a building site. A NSW RFS Situation Report at 12:17pm indicated that the fire was approximately 2 hectares in size and that units were responding. Properties in Widgiewa Road, to the south east, came under threat within the hour and at 1:31pm an Emergency Warning was issued advising residents that there was a bushfire in the Carwoola area and that people should seek shelter to protect themselves from the heat of the fire. The fire impacted heavily on properties in Widgiewa Road and Whiskers Creek road over the next couple of hours, with residents in neighbouring streets including Douglas Close, Bowen Street and Captains Flat Road also being affected. Shortly before 3pm firefighters were assisting residents to evacuate along both sides of Widgiewa Road. At 3pm the temperature had reached 31.4°C, with north westerly winds to 31kph and relative humidity of 21.5% (Forest Fire Danger Index 33 – Very High). Shortly after, reports were received that the main fire had crossed Captains Flat Road and was heading in the direction of Hoskinstown and Rossi. From this point on, the Incident Management Team (IMT) received reports that houses were alight and some had been destroyed. At 4pm a Section 44 was declared for the Queanbeyan-Palerang LGA. Around 5:30pm Large Air Tanker 391 dropped retardant on the fire and a Very Large Air Tanker (VLAT) was working to keep the fire west of Hoskinstown Road. Fire behaviour reduced significantly during the evening and firefighters worked to strengthen control lines.



Saturday 18 February saw a significant reduction in fire behaviour, allowing firefighters to contain the fire by early evening. On Wednesday 1 March the fire was officially declared 'Out'. It burned 3,134 hectares of land and destroyed 11 houses and 45 outbuildings. Agricultural and other assets including fences, pasture, gardens and animals were also damaged and destroyed.



3. RESEARCH METHODS

The research involved semi-structured, in-depth interviews with people affected by the Currandooley, Carwoola and Sir Ivan bushfires, and an online survey of all areas at risk of bushfire in NSW in 2017.

3.1 SEMI-STRUCTURED INTERVIEWS

Semi-structured, in-depth interviews were conducted in June and July 2017 with residents affected by the Currandooley (n=36), Carwoola (n=38) and Sir Ivan (n=39) fires. Semi-structured interviews were undertaken to gather precise and codeable qualitative data related to the issues and themes under investigation (see Table 2). The interview guide comprised open-ended questions about: planning and preparation for bushfire; intended and actual responses to the fires; and the impact of the fires on people and property (see Appendix 1). Semi-structured interviewing allows interviewees to frame and structure their responses according to their own personal experiences and narrative. The advantage of this approach is that the interviewee's perspectives and experiences unfold as the participant views it, not as the interviewer views it (Marshall and Rossman 2011). This allows each interviewee's unique perspective to come through clearly and can help researchers to identify new issues and lines of questioning not previously considered.

Each fire area was visited prior to fieldwork commencing. The lead author met with NSW RFS District Managers and volunteers to provide information and gain local support for the research. Local NSW RFS people played a key role in promoting the research within their communities through, for example, communications via email lists and posts on local Facebook pages. In addition, letters and Participant Information Sheets (PIS; see Appendix 2) were dropped in letter boxes in fire affected areas to provide more detailed information about the research and notify residents and businesses of when interviewers would be in the area. While some interviews were arranged in advance, most were undertaken following door knocking of addresses where letters and PIS had previously been left.

Interviews were undertaken at participants' homes and, in a small number of cases, at NSW RFS brigade sheds and local cafes. Participants were given time to read the PIS prior to the interview commencing and written consent was obtained. Interviews typically lasted for 45 minutes to one hour and were audio recorded subject to the participant's consent. Basic demographic data were collected from participants via an anonymous demographic sheet completed by the researcher at the end of the interview. Audio recordings were transcribed in full.

Characteristics of the Currandooley interview sample

36 interviews were conducted with 44 participants. 59% were male and the majority of participants were middle-aged (see Figure 4). 81% indicated that they lived on a hobby farm or small acreage, with the remaining 19% on large farm properties. 92% of properties were owned (with or without a mortgage). 19% of participants had lived in the area for over 20 years, 22% for between 10 and 20



years, 11% for between 6 and 10 years, and 39% for five years or less. In terms of household composition, 36% comprised a couple without children or other dependents, 17% were single-person households and there was one shared house with other adults. 22% of households comprised a couple with children or other dependents and there were two single-parent households. At the time of the bushfire, 43% of participants were registered members of the NSW RFS. Two participants (5%) were not registered but had been in the past.

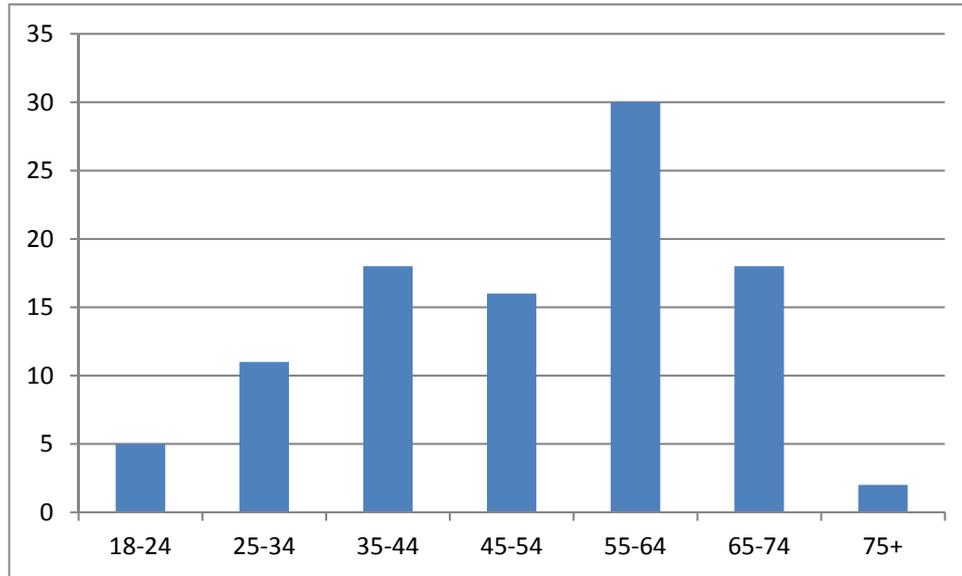


Figure 4: Age profile of the Currandooley interview sample (%)

Characteristics of the Carwoola interview sample

38 interviews were conducted with 52 participants. 54% were male and the majority of participants were middle-aged and elderly (see Figure 5). 79% indicated that they lived on a hobby farm or small acreage, with the remaining 21% on large farm properties. 89% of properties were owned (with or without a mortgage). 39% of participants had lived in the area for over 20 years, 16% for between 10 and 20 years, 13% for between 6 and 10 years, and 32% for five years or less. In terms of household composition, 50% comprised a couple without children or other dependents, 11% were single-person households and there was one shared house with other adults. 32% of households comprised a couple with children or other dependents and there were two single-parent households. At the time of the bushfire, 18% of participants were registered members of the NSW RFS. A further 21% were not registered but had been in the past.

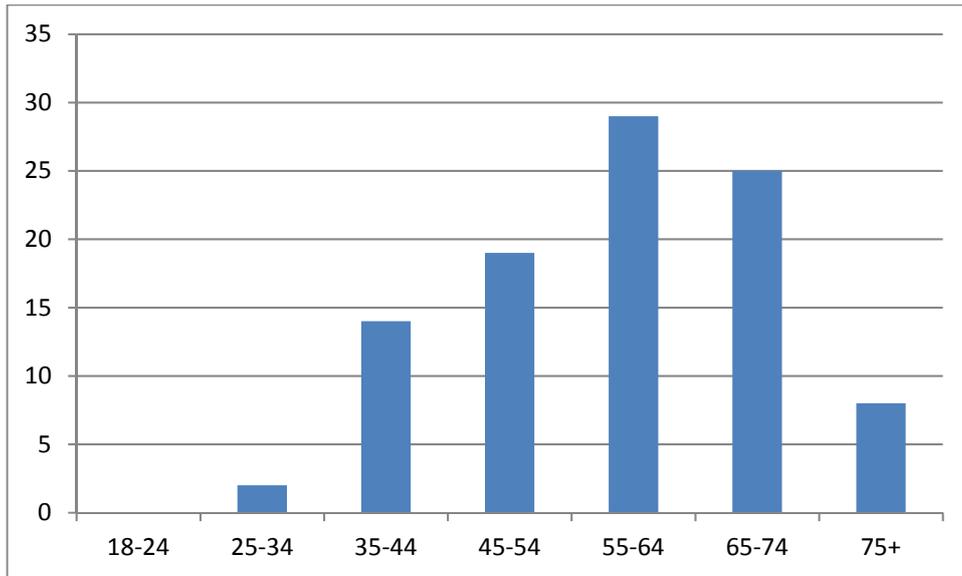


Figure 5: Age profile of the Carwoola interview sample (%)

Characteristics of the Sir Ivan interview sample

39 interviews were conducted with 49 participants. 57% were male and the majority of participants were aged over 55 years (see Figure 6). 26% indicated that they lived in a house or unit on a residential block, 13% on a hobby farm or small acreage, 51% on a large farm property, and 7% had land without a house. 90% of properties were owned (with or without a mortgage). 49% of participants had lived in the area for over 20 years, 13% for between 10 and 20 years, 10% for between 6 and 10 years, and 21% for five years or less. In terms of household composition, 33% comprised a couple without children or other dependents, 13% were single-person households and 10% were shared houses with other adults. 33% of households comprised a couple with children or other dependents and there were two single-parent households. At the time of the bushfire, 36% of participants were registered members of the NSW RFS. Four participants (10%) were not registered but had been in the past.

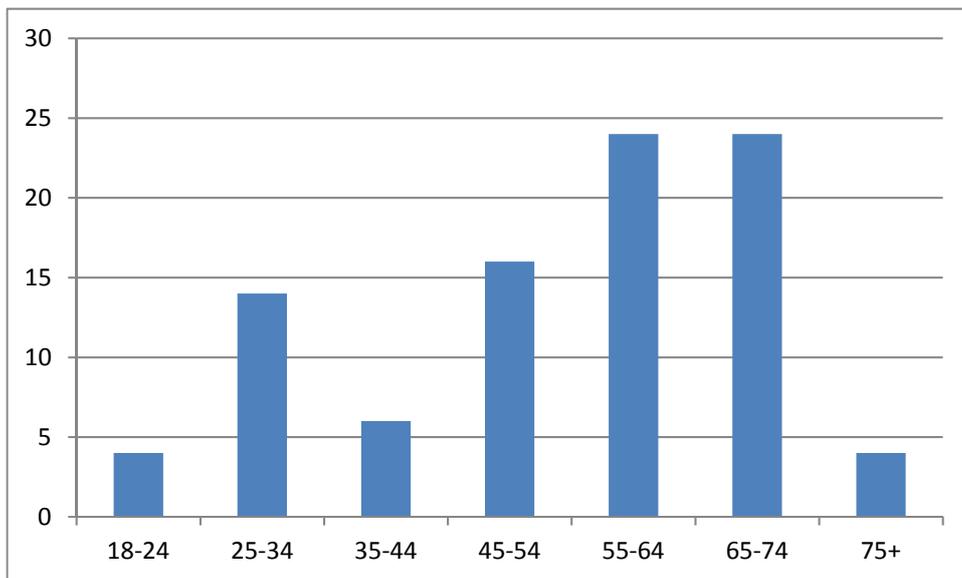


Figure 6: Age profile of the Sir Ivan interview sample (%)



The Computer Assisted Qualitative Data Analysis Software NVivo 11 was used to analyse the interview transcripts. Categories into which segments of interview text could be grouped (known as 'nodes' in Nvivo) were derived from the issues and themes under investigation (see Table 2). The process of analysing interviews involved reading transcripts in full and selecting text to drag into relevant nodes ('coding'). This process enabled interview text to be grouped into relevant nodes to enable closer analysis. A number of 'emerging issues and themes' were identified that were considered important but were not captured by the existing nodes. These include: 'Public expectations of fire and emergency services'; 'Local knowledge and participation'; 'Animal-directed behaviour and interactions'; and 'Fire impacts'.³

Table 2: Coding framework for analysis of interview transcripts

Theme 1: Information and warnings
a. Effectiveness of warnings and resulting actions
b. Did information and warnings assist protection of agricultural assets?
c. Delivery of Catastrophic messages
d. How people sought information about the fires
e. Drivers for entering or re-entering fire grounds (incl. roadblocks)
Theme 2: Planning and preparedness measures
a. Perceptions of risk
b. How people prioritised protective responses
c. Perception of risk to and value of agricultural v. domestic assets
d. Influence of fire history/experience on planning, preparedness and decisions
e. Identified NSW RFS intervention strategies
f. What information or advice people sought out in the lead up to the specific fire event
Emerging issues and themes
a. Public expectations of fire and emergency services
b. Local knowledge and participation
c. Animal-directed behaviour and interactions
d. Fire impacts

³ In addition to the core research themes, findings related to 'Public expectations of fire and emergency services' and 'Local knowledge and participation' are presented in this report. Data on 'Animal-directed behaviour and interactions' and 'Fire impacts' may be used for future research.



3.2 ONLINE SURVEY

A questionnaire was developed in consultation with the NSW Rural Fire Service to survey areas of NSW that were threatened by bushfires and/or experienced Catastrophic fire danger in 2017 (see Appendix 3). The purpose of the questionnaire was to gather quantitative data on the issues and themes under investigation. The online survey launched on the SurveyMonkey.com website on Thursday 17 August and closed on Sunday 24 September. A total of 624 responses were received. 75 responses were deemed insufficiently complete because no questions, or only demographic questions, were answered. These responses were removed, leaving a total of 549 responses with an 89% completion rate.

61% of survey respondents were female, 38% were male and 1% identified as another gender. Almost half were aged 35-44 (24%) or 45-54 (25%); relatively few were aged over 65 (7%) (see Figure 7). Respondents most commonly lived on a house or unit on a residential block (44%) or in a house on a hobby farm or small acreage (37%). A smaller yet considerable proportion lived in a house on a large farm property (16%). For the vast majority of respondents, this was their main residence (95%). Four-in-ten had lived there for five years or less (39%), while two-in-ten had lived there for 6-10 years (20%), 11-20 years (21%) and over 20 years (19%). Most respondents owned their house or property with or without a mortgage (80%); 16% were renting, 2% were managing a house or property, and 3% had other arrangements. In terms of household composition, 47% comprised a couple with children or other dependents and 6% were single-parent households. 27% of households comprised a couple without children or dependents, 10% comprised a shared house with other adults and 6% were single-person households. The majority of respondents had pets or companion animals (73%), with smaller proportions having horses (21%), 'pet' livestock (18%), commercial livestock (15%) and working or service dogs (14%). More than a quarter of respondents were NSW RFS members (29%) and 8% had been members in the past. 10% of respondents were members of a Community Fire Unit.

Half of all survey respondents (52.2%, n=253) indicated that they were impacted or threatened by a bushfire in NSW during the 2016-17 fire season.

Online survey data were analysed using the SPSS Statistics software. Selected results are presented for each research theme in the following section. Note that percentages may not add up to 100 due to rounding.

Note that findings related to 'How people sought information about the fires' and 'What information and advice people sought out in the lead up to the specific fire event' are presented together at Section 4.4.

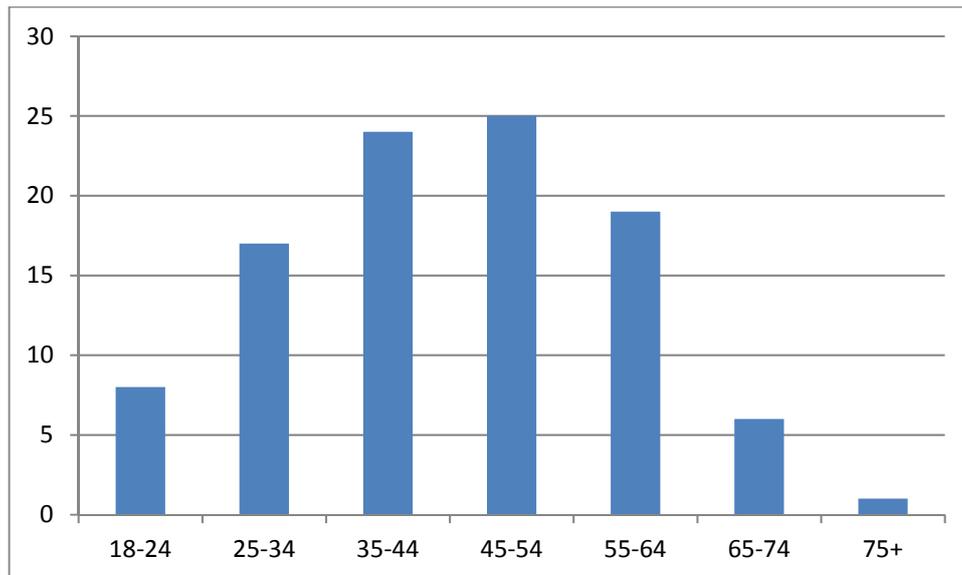


Figure 7: Age profile of online survey respondents (%)

3.3 ETHICS AND FIELDWORK RISKS

Ethics approval for the research was obtained from the University of Wollongong's Human Research Ethics Committee (Ethics Number 2017/216). Measures were taken to ensure the safety and rights of participants and researchers, and to ensure participants' anonymity in any reports, papers, presentations or other publications arising from the research.



4. FINDINGS

4.1 EFFECTIVENESS OF WARNINGS DELIVERED TO THE COMMUNITY

Online survey

Results from the online survey suggest that, on the whole, warnings delivered to community members threatened by bushfire in 2016-2017 were effective. As shown in Table 3, most respondents (around 8-in-ten) believed warnings were easy to understand and useful. The majority of respondents thought warnings were timely, up to date and sufficiently localised; however, there was a considerable proportion that did not. For example, 39% of respondents did not think official warnings via landline telephone were sufficiently localised. Around one-third did not think SMS warnings were timely, up to date or sufficiently localised. Results suggest that Fires Near Me was a particularly effective means for communicating warnings and information, with large numbers of respondents indicating that it was easy to understand (88%, n=172), useful (82%, n=159) and sufficiently localised (76%, n=148). Fewer, but still around two-thirds (66%, n=130), thought it was up to date. It is noteworthy that respondents most commonly identified SMS as their preferred method for receiving warnings and information (51%, n=122), followed by mobile phone apps (14%, n=33).

Caution is needed when interpreting these results. Survey respondents were threatened to varying degrees by different fires. Differences in the degree of threat will have influenced the timing and content of warnings. Additionally, people are likely to have received warnings from multiple sources. Thus, for example, someone might not see a SMS warning as being particularly useful or sufficiently localised, yet receipt of a SMS may prompt searches for more detailed information via Fires Near Me or radio.

Table 3: Survey respondents' assessments of official warnings (in percentages)

	Timely	Up to date	Easy to understand	Sufficiently localised	Useful
Landline telephone	68 (n=34)	72 (n=36)	78 (n=39)	53 (n=26)	78 (n=40)
SMS	66 (n=78)	66 (n=78)	86 (n=105)	64 (n=76)	67 (n=78)
Radio	76 (n=56)	64 (n=47)	87 (n=65)	73 (n=54)	82 (n=61)
Fires Near Me	NA	66 (n=130)	88 (n=172)	76 (n=148)	82 (n=159)
RFS updates, interviews, media conferences	71 (n=111)	68 (n=108)	84 (132)	69 (n=109)	73 (n=114)

86 respondents provided additional comments about warnings and information provided about the fires. The following quotes provide an indication of the types of comments made by respondents:

'No mobile reception. Satellite tv. Listen to internet radio. You don't know how to communicate to people in the bush.'



'No mobile coverage areas should be well documented. On the ground personnel should be listened to, not decided 100km away.'

'Diversity of sources is important - radio, internet, & bushfire info line are paramount, because some want specific localised directions, some want general area info, and others (eg overseas) want info they can get to about where family are living. for info on specific fire threatening our home, targeted phone is clever, but it is wrong to assume that everyone has a phone on them and it is working!'

'I think a combination of information sources is important as they are each better for some things and not as good at others (e.g. fires near me app best for seeing where the fire is/has been, but no good for road closure info which was best from ABC Canberra Radio)'

'On local ABC radio I expected to get 2 warnings - 1 to evacuate now and a 2nd saying it was too late to evacuate. I only heard 1 - the too late to evacuate announcement.'

'I think utilising all the varying forms of communication is helpful for all people. A system of being able to advice local businesses; especially those of aged care and hospitals, would help calm patients down, and early warning of impact for those kinds of facilities, may assist staff working in them to properly plan and evacuate if needed.'

'Need to ring all mobiles and landlines as our mobile reception is bad. If phone lines go down another method has to be found as we live in a VERY bad mobile reception area/ We are also satellite NBN so if we lose the tower we lose all lines of communication'.

Interviews

Interviews with residents threatened by the Currandooley, Carwoola and Sir Ivan bushfires provided numerous insights into how people received and responded to warnings. Many residents already knew about the fire when they received telephone or SMS warnings. They often became aware of a fire by seeing or smelling smoke, through communication with relatives, friends and neighbours, or by seeing or hearing activity associated with firefighting, such as sirens:

I do remember that the very first thing I saw was, the very first thing that caused me to pick up my attention a bit, was the smoke, the column of smoke coming from over there. And I'm confident that the next thing was this lady's phone call, telling me they were leaving.

- Mount Fairy



Well I was reading over in that corner of the property, and a couple of fire trucks went by in quick succession. I automatically looked around and saw the smoke over the back gate not very far away. I came back to the house, and I came through the gate and could see that the hill was on fire there, which was uncomfortably close. I straight away went inside, sent a message to my husband to say that there was a fire nearby...

- Carwoola

I heard a neighbour tearing up my driveway at a million miles an hour. I was in here working and completely unaware that anything was going on. When he came up the driveway, he didn't think anyone was home because he didn't see any cars, they were in the garage. So, he basically did a donut in my driveway and flew out at a million miles an hour, which then sent me going outside wondering who it was. When I looked up, that's when I saw all the smoke and smelt the smoke, and from then on realised how bad things were. About, don't quote me on the time, but about 15, 20 minutes later, I then got a text message from emergency services saying, "Take shelter, it was too late to leave."

- Carwoola

Although many interviewees were already aware of the fire by the time they received an official warning, for some, receipt of an official warning communicated the danger posed by the fire and confirmed the need to take action:

Male: We got texts from another brigade, I think. We were prepared at that stage.

Interviewer: So they weren't really useful to you at that time?

Male: It was nice.

Female: It was reinforcing that the fire was a problem. Some people said they didn't get any notification, but he had a phone, I had a phone, and we both got the message.

Male: We were certainly notified. It was nice to hear it. Just to know that we were not doing things for nothing, I suppose.

- Carwoola



A small number of interviewees found warnings confusing or felt they caused unnecessary worry or anxiety. One resident could not recall specific information or advice provided in a recorded message on his landline telephone, but remembered finding it confusing. The degree of danger it conveyed to him did not align with his assessment that the fire was a long way away, that the wind wasn't excessively strong, and that firefighters would probably get it under control:

It wasn't a personal call, it was a recording. But it was confusing. It didn't say 'You need to evacuate'... I thought, 'Okay, I'm not going to evacuate because it's a long way away and there's a lot of time' and there was no wind. It was hot and shocking, but it wasn't howling wind or anything. They'd gone off to fight this fire and then I saw, later in the day, planes and I thought: 'Oh fuck it, it's fine. They've got a really good chance'. Anyway... It was confusing. It said something about it being dangerous in the area and I knew all that anyway, so that was that.

- Coolah

A resident in Uarbry also explained how the recorded message he received did not accord with his assessment of the weather conditions and the seriousness of the bushfire. Direct advice from a police officer motivated him to leave:

The phone would ring and I'd pick it up and this is the RFS or whoever they were saying, "You've gotta get out, be prepared." "Fire" and all the rest of it. But I didn't take heed of that because I'm looking around... Well I just couldn't believe it, that this was an area where it was going to go up like that. I didn't think the fire was as big as it was. But it came on that quick and I'm glad the police got me out.

- Uarbry

Another interviewee explained how multiple SMS messages about the fire contributed to his wife's sense of panic. Their plan was to stay and defend their house and farm property, a plan they were already putting into action. Although he understood the purpose of the SMS messages, which he acknowledged would be useful for those who were not yet aware of the fire, he felt they were unhelpful in their personal circumstances:

Male: My wife's phone was going mad with texts... 'Too late to leave, take shelter' and all this sort of thing. So she was panicking like crazy.

Interviewer: As a result of those messages?

Male: Yes. Well she was already a bit panicky and, yes, they were not



helping...

Interviewer: Was the panic caused by the fact that the text was received, or what was actually written in the text itself?

Male: Basically, the 'too late to leave, take shelter'. The wife was just 'Ugh', because we were out on the road still at that stage. The fire was still a bit of a distance away but, at the speed it was travelling, yes it could have been there, especially with spot-overs or whatever... So it probably was good advice, but to us personally it was unhelpful. But as I said, if I had been at home contemplating whether to stay or go, well maybe then... But as I said, I've got to stay and protect.

- Coolah

Similarly, some residents threatened by the Currandooley fire felt warnings and advice contributed to stress and anxiety:

I know they say it's to alert people, and I believe in the Black [Saturday bushfires], the ones down in Victoria, some people were oblivious to the idea that there was fire around them. But I find getting messages from the government ... "You should leave now or else!" It actually raises your adrenaline level up... To me, it was incredibly unhelpful so I completely ignored it after a while. I could see the fire, I didn't need to be told it was coming. I know why they do it, it's just that was my personal reaction to the thing.

- Mount Fairy

Interviewer: Did you receive a message or a text message this time around? And did that influence your actions in anyway?

Female: Not ours because we were already here and we were already aware of it. We knew what was going on and we knew exactly how close it was. Yeah, probably what upset me, was the kids were getting them on their phones, and that's fair enough because it just goes out but it was alarming the kids.

- Tarago

Once people became aware that a fire was threatening, they typically began an ongoing process of information search that included communication with others within the threatened area (e.g. relatives, neighbours, NSW RFS members) and information searches via the internet or smart phone applications. Interview data highlights the tendency for people to call or SMS others within their local area to obtain and share information about the fire. These communications often



alerted people who were unaware of the fire, often because they were working or inside trying to stay cool:

I was working on my computer and it was about maybe 2.30, quarter to 3 something like that, when [name removed] rang... She called me and said, "Oh. What are the flames on the back of your hill?" I said, "I don't have any flames on the hill." Anyway, I went outside and I couldn't even see any smoke, at that point. Well, we finished the call, and it wasn't long afterwards when I did see it, because I went out again and I did see some smoke coming up over the back.

- Carwoola

It continues to strike me how lucky I was that my phone was on for a start. It's out of batteries now, right? It's often out of batteries. Or it's often not switched onto Wi-Fi. You know, you just don't use it that much here... I was inside with all the windows and doors closed because it was so hot. I was trying to stay cool. So there was no indication to me that there was any smell [of smoke] until I went out onto the veranda. Who knows when I would've found out... I mean it was just that I'd had the message from [name removed].

- Tarago

Upon becoming aware of a fire, many interviewees used the Fires Near Me website or smartphone application to obtain more detailed and localised information about the fire. On the whole, and across the fires, interviewees expressed strong support for and satisfaction with Fires Near Me. Interview data suggests that people like Fires Near Me because it provides information about the fire in map form, allowing them to assess their location in relation to the fire and its direction of spread, and because it provides information on the official status of the fire:

The Fires Near Me app was very good actually because I could see exactly where the fire was going and the local area and all that sort of stuff. That was good because I could see that it had got out of hand, and it had jumped the highway...

- Cassilis

Interviewer: Was Fires Near Me useful?

Female: Yes, because it told you what the ferocity of the fire was. What are all the terminologies?

Male: Out of control.



Female: Yeah, out of control or under control... It was good to be able to see what they called it. 'Out of control' is not great, but at least it's nice to know.

- Hoskinstown

Fires Near Me is invaluable because I knew, you know, they said 'Out of control'. I knew exactly where it was and I just, yeah, I guess that sort of kept me pretty well informed... I think I got a message to evacuate when I was driving down Captains Flat Road... There was a message on the answering machine when I got back too... it was the main line and the mobile, so I don't know what else they could do really apart from a door knock.

- Carwoola

I had a bad feeling about it all. I was watching it spread on the rural Fires Near Me. I saw it across the road and I started to panic because the weather was so hot and windy. It was just, it had a bad thing going on. The power went out and I started packing. And I left about 11:00. I made it through into Mudgee to a friend's house.

- Cassilis

How we first became aware of the fire was we were in town, and we were driving back in an easterly direction and I could see smoke on the horizon. This was probably around about 12 o'clock, and we were probably about William Hovell Drive in Belconnen, where I first saw what I thought was smoke. I couldn't be sure and then as we kept going home, around about the airport, I could see it really was smoke. Then, at that point I checked the Fires Near Me app, and I could see that there was a fire in Carwoola. Probably would have been about 20 past 12.

- Carwoola

Despite the strong support for and satisfaction with Fires Near Me, some interviewees had ideas about how it could be improved. It was noted that Fires Near Me does not offer 'push notifications'. Push notifications are messages that pop up on a mobile device irrespective of whether a person is using the device or app. Some interviewees believed that the Fires Near Me app should provide push notifications, although it was noted that too frequent notifications could contribute to 'warning fatigue':



You have to be monitoring the Fires Near Me app. Maybe there should be an alert system, if you've got your app functioning and if there's a fire within, I dunno, a 20k radius of you, perhaps you should be made aware. Perhaps there should be an alert system on that app.

- Tarago

Female: There's another app, called 'Emergency app' and it has all information, not just RFS information... So, some people use that. That does have a push notification, you can get those alerts but then you get alerts of like, "There's an accident here, there's an accident there," and then you just tune out because there are too many alerts.

Male: That's not an official one and we hadn't heard about it till after the fire anyway, but we assumed that the best app was the one recommended on the RFS website.

- Carwoola

At Carwoola, a resident on a small acreage provided insights into her response to receiving warnings and information, which focused on her responsibility to protect her valuable 'show chickens'. She monitored the Fires Near Me app, waiting for information that would confirm that the fire was going to impact and that it was in fact necessary for her to leave. She did not want to inconvenience others who would have to help, or cause unnecessary stress for her animals:

I was also keeping an eye on the, I think it's called Fires Near Me app, and the RFS app for updates as well, just trying to gauge what their response was, whether it was as urgent as what it seemed. Because when you're standing on your block looking at smoke that seemed to be a few kilometres away, it's really hard to get any sense of urgency because it looks like it's going away. And thinking about the logistics of trying to catch scillions of chickens and loading up cars and trailers and inconveniencing people who potentially then might have had to turn around and bring all my birds back again, it was just ... It was really difficult to try and work out whether there was an immediate need to go or not. Then yeah, when the wind changed we realised we just needed to get out, but in hindsight...

She explained her dilemma further:

Do you go through that whole evacuation process knowing that the fire looks like it's going away from you and it could be for absolutely nothing? Because animals get very stressed when you grab them in a



hurry. The chooks that I did get out all stress moulted and freaked out, lost all their feathers. Yeah, it was incredibly stressful.

- Carwoola

Similarly, interviewees in Coolah explained how their inability to safely move their horses prevented them from leaving after receiving advice to do so from the local police:

The police from Coolah did come through and say, 'You know, you really should evacuate'. But at that stage we thought, 'We'd rather stay here'. Because we didn't move our animals. I didn't really see how we could safely move them anyway, and that's why I'm saying that I was unprepared if I had to move my animals. I still don't know what I would have done.

- Coolah

In each of the fires there were people who did not receive an official warning or, more commonly, received a warning after learning about the fire ('too late'). Limited mobile phone coverage was a factor impeding the delivery of SMS warnings in each of the fires, but was most apparent in areas affected by the Sir Ivan fire. It is important to note that limited mobile phone coverage is an everyday challenge in many of these areas, so most people were not relying on receiving a SMS warning. Nevertheless, interviewees saw the benefits that would come with better mobile phone coverage, including a greater capacity to communicate in emergencies:

In these days of internet and mobile phones, smartphones and stuff, they're the tool of choice for most people really. And we deal with people in town and they're amazed at, sort of, 'You'll have to ring the landline at night, you won't get me on the mobile'. 'Why not?' 'We just don't get coverage'. 'Oh!' That's not a thought that crosses their mind. They think it works all the time'.

- Cassilis

The fact that we don't get good coverage out here is pretty significant. You know, we should really have a mobile phone tower out here so that we can actually receive regular text messages. Oh and with regard to that. I did get a warning from the RFS or whoever sends the messages, but it was about three o'clock in the afternoon when it had well and truly ... You know, the imminent danger had



passed. The fire had actually passed over the whole property and I was four hours ahead in my knowledge of it.

- Tarago

'We don't have mobile phone coverage here that's reliable. We get, at most, one bar. Well, if we're lucky. Most of the time: zero. We can get some SMS, and then we get some phone calls according to where we're standing on the property. It's not reliable, and therefore things like Fires Near Me could go off, just the same as the phone system.

- Carwoola

Overall, interview data highlight the importance of local social networks in the dissemination of warnings and information, and the multi-source and ongoing information seeking that occurs once people become aware of a fire. Most people do not rely on one source of warning, particularly where mobile phone coverage is known to be limited.

4.2 DID WARNINGS AND INFORMATION ASSIST PEOPLE TO REDUCE RISKS TO AGRICULTURAL ASSETS

Large farm properties

Of the 85 survey respondents who had a house on a large farm property, 64 (75%) indicated that they were threatened or impacted by fire in 2017. They most commonly found out that a bushfire was threatening by smelling or seeing smoke (32%, n=20) or through family, friends or neighbours (27%, n=17). Six respondents (10%) found out about the fire through an official SMS or telephone warning.

As outlined in Table 4, respondents on large farm properties most often received or accessed warnings via Fires Near Me, SMS and NSW RFS updates, interviews and media conferences. Again, results suggest that Fires Near Me was a particularly effective means for communicating warnings and information, with large majorities of respondents finding it easy to understand, sufficiently localised, up to date and useful.



Table 4: Assessments of official warnings (%) - house on large farm property

	Timely	Up to date	Easy to understand	Sufficiently localised	Useful
Landline telephone (n=12)	69 (n=9)	69 (n=9)	69 (n=9)	69 (n=9)	77 (n=10)
SMS (n=32)	65 (n=20)	52 (n=16)	75 (n=24)	61 (n=19)	63 (n=19)
Radio (n=18)	78 (n=14)	67 (n=12)	83 (n=15)	72 (n=13)	78 (n=14)
Fires Near Me (n=47)	NA	72 (n=34)	85 (n=40)	77 (n=36)	76 (n=35)
RFS updates, interviews, media conferences (n=32)	58 (n=18)	58 (n=18)	77 (n=24)	65 (n=20)	66 (n=21)

Less than half of the respondents on large farm properties accessed warnings via the internet (42%, n=25). These respondents most commonly sought information about the location of the fire 74% (n=26), roads (e.g. traffic, road blocks; 54%, n=19), firefighting activities (46%, n=16) and weather conditions (42%, n=15). Information was less commonly sought about likely time of impact (23%, n=8), what to do (17%, n=6) and where to go (17%, n=6). More than half of these respondents used social media during the fire (58%, n=35), with comments from respondents again indicating that local NSW RFS and local community Facebook pages were the most useful source of information.

Respondents on large farm properties most often identified family, friends or neighbours (31%, n=18) as the most useful information source during the fire, followed by Fires Near Me (25%, n=15). They most often identified SMS as their preferred method for receiving warnings and information (39%, n=23), mobile phone apps (15%, n=9), recorded phone messages (10%, n=6) and radio (10%, n=6).

Hobby farms and small acreages

Of the 203 survey respondents who had a house on a hobby farm or small acreage, 113 (56%) indicated that they were threatened or impact by fire in 2017. They most often found out about the fire by smelling or seeing smoke (23%, n=25) or through communication with family, friends or neighbours (23%, n=23). Others found out via Fires Near Me (16%, n=17), NSW RFS brigades radio (7%, n=8) and official warnings via SMS or telephone (6%, n=7).

Respondents on hobby farms or small acreages most often received or accessed warnings via Fires Near Me and NSW RFS updates, interviews and media conferences (Table 5). Results suggest that both methods were largely effective, although slightly fewer respondents felt that Fires Near Me was up to date (65%, n=59; compared to 72% of respondents on large farm properties and 66% overall).



Table 5: Assessments of official warnings (%) - hobby farm or small acreage

	Timely	Up to date	Easy to understand	Sufficiently localised	Useful
Landline telephone (n=21)	57 (n=12)	67 (n=14)	81 (n=17)	40 (n=8)	71 (n=15)
SMS (n=51)	57 (n=29)	67 (n=34)	90 (n=47)	68 (n=34)	64 (n=32)
Radio (n=40)	74 (n=29)	67 (n=26)	90 (n=36)	74 (n=29)	85 (n=33)
Fires Near Me (n=92)	NA	65 (n=59)	87 (n=79)	76 (n=69)	79 (n=72)
NSW RFS updates, interviews, media conferences (n=77)	71 (n=54)	70 (n=53)	86 (n=65)	65 (n=49)	75 (n=56)

Over half of the respondents on hobby farms or small acreages accessed warnings or information via the internet (64%, n=68). They most commonly sought information about the location of the fire (27%, n=55), weather conditions (19%, n=39) and roads (e.g. traffic, road blocks; 18%, n=37). They less frequently sought information about firefighting activities than respondents on large farm properties (16%, n=32, compared to 46%, n=16). Almost two-thirds of these respondents used social media during the fire (64%, n=86), with comments indicating that local RFS Facebook and community Facebook pages were the most useful social media sources of information.

Respondents on hobby farms and small acreages most often identified Fires Near Me (32%, n=34) as the most useful information source during the fire, followed by local NSW RFS members (16%, n=17) and family, friends or neighbours (15%, n=16). They most often identified SMS as their preferred method for receiving warnings and information (52%, n=55) and mobile phone apps (16%, n=17).

Interviews

A key difference between the Currandooley and Carwoola fires and the Sir Ivan fire was the time between ignition and the fire becoming a threat to life and property. The Currandooley and Carwoola fires threatened communities within hours of ignition, whereas the Sir Ivan fire began on the Saturday and mostly threatened communities on the Sunday and early into the following week.

In the Currandooley and Carwoola fires, some agricultural landholders were away from their properties and returned after learning that there was a fire. In Tarago, one farmer returned from a business trip hundreds of kilometres away after receiving a warning about the fire. In Carwoola, another returned from a meeting in Sydney after receiving phone calls and SMS messages advising him about the fire:



On the day of the fire I was in Sydney in a meeting, so I got numerous phone calls and texts about midday saying there's a fire. So I left the meeting and got on a plane, and I got down here. In the meantime I'd been talking to my staff and we were going through the fire plan on the phone.

- Carwoola

In contrast, many people found out about the Sir Ivan fire on the Saturday afternoon, the day before it posed its most serious threat. Some of these people were at the Dunedoo Show when smoke became visible and an announcement came over the public address (PA) system:

We were at the Dunedoo show... We went, "That looks pretty close to home." That was on the Saturday, before the worst of it started. Then, they put it over the PA that there was a fire on our road and anybody from that area should make their way home. So, we drove down.

- Leadville

Actually, [we were aware] pretty much as soon as it started. We were in the Dunedoo show and we were watching ... I can't remember what we were watching. Oh, the dog trials. And we heard someone say, "Oh, I've got to go. There's a fire." And the next thing people were scurrying off. And in the course of the time that we were there we just we were watching the smoke become more and more. And then when we headed for home ourselves, as we came along the highway we could see the smoke over the hill. And then further along we could see where it was creeping. The grass fire was creeping down over some of the hills. It didn't look too bad at that stage.

- Uarbry

On the Saturday night, some people were aware of the fire but thought that it was, or would soon be, under control. Some received SMS warnings on the Saturday and Sunday but, despite the forecast Catastrophic fire danger conditions, did not believe that the fire would reach them:

We first became aware of the fire by visual smoke on the Friday or Saturday. Then we were just following the RFS app on our phone as to what stage it was at. On the Saturday, we received the text message and the phone call making us aware that it was 'Watch and Act' and that if we wished to evacuate we should do so. At that point in time, I suppose we didn't take that very seriously because of how far away it was and how unlikely in our country at that point, that's what we believed, it was to reach us. We checked again on Saturday night



and the fire on the app had been downgraded to under control. Sunday morning it was still under control on the app, but we were aware of the change in the weather that was coming... then towards lunchtime I noticed the smoke was just getting a bit out of control. We were still checking the app. It had then said it was out of control again, but we had no idea to what extent.

- Coolah

Male: We saw the smoke and everything Saturday, so we checked around and saw some people. Yeah, well we didn't think it was going to affect us on Saturday. We thought it would be under control Saturday night.

Female: Even Sunday we didn't think it would affect us. Because we went for a drive at lunchtime and we still didn't think that we would get burnt out. It was only when we went over to the neighbours and asked them... He said, 'It's going to wipe us out this afternoon... So you've got to stand and fight or get out'.

- Cassilis

One interviewee who was monitoring the Fires Near Me app on the Saturday night recalled that the fire was designated 'Under control'. She believed this contributed to a sense of complacency within her household:

The fire should never have been called under control on the Saturday night so that everyone was aware that it was still a great risk. Because under control means that it's under control. Not uncontrolled within containment lines, which I think would have more technically described the fire on Saturday night. It was out of control, within the containment lines, but I don't believe [in hindsight] it was ever under control... It's our fault too. We read it was under control, so we just trusted it was under control. Then Sunday morning it didn't really ... The wind and that didn't pick up until a little bit later in the morning and because we leave early, everything was kind of quiet and seemingly okay. There wasn't a big billow of smoke that we could see. We kind of just went about our normal day when we really shouldn't have been that complacent about it all.

- Coolah

Once it was clear that the fire was threatening, most agricultural landholders had some time to make last minute preparations and respond. Most commonly, they moved livestock to paddocks or other areas on their properties that would provide some protection from the fire:



I moved sheep and just tried to get prepared. I tried to clear things as much as I could from the house. It's about then that you really look and think, "Oh shit, there's that there and that there."

- Coolah

Come Sunday, when it was ominous, we thought we were a big possibility of the fire coming up the valley. We started to move all the cattle and put them on the sanctuary block.

- Cassilis

Basically I had cattle up on hill, where there was three, four foot high cured saffron thistle and nowhere to go. So if the fire had come through that there, they would be barbecued. I would have lost a couple hundred thousand dollars' worth of stock. Yes, so I got them off the hill, brought them down where there wasn't much to burn. Which was a couple k's away it - was another block that I have got.

- Coolah

Male: Saturday night I did get them to shift some stock and get them a bit closer, on a bit safer ground.

Interviewer: Yeah, and how much stock have you got?

Male: We'd have five, six, seven thousand sheep. A hundred, a couple of hundred cattle... It's a big loss if you lose your stock. That's where we make our money.

- Leadville

While most interviewees were aware of the fire and received a warning, one interviewee on a more isolated agricultural property felt that he was not adequately warned. Although he was aware that a fire was burning nearby, he did not receive a warning that the fire was going to impact on his property. He was aggrieved that he didn't receive a warning directly, but also that others had not passed it on:

There was no texting that was of any benefit. There was no warning... You know how many people were unprepared for this fire, because they didn't realise it was going to get to them?... All the people that lost their houses right here... they had no idea, they had no communication. 'Tell your mates; have you spoken to your mates?' Ring them up, just spend five minutes on the phone ringing up your mates and say the RFS has given this warning. Nothing, there was



nothing. I didn't receive a thing.

- Dunedoo

Another agricultural landholder, at Cassilis, was receiving information from official sources but believed it was out of date. His children were communicating with others in the area via Facebook and snapchat, who were then passing the information on to him. He appreciated the localised, 'real time' nature of these communications and, in particular, valued photos of the fire that were being sent:

The information [from locals] is valuable... That sounds pretty derogative towards the police and stuff. I know what you guys are trying to do, to provide the information, but again your delay kicks in. These [local] people pick up a phone and Snapchat and they're looking at the fire on their property. We know where they live, we can recognise by photos they take. 'Oh! That's exactly there'. So that information is really accurate and real time... Well, we trust it because we know where the people are... Not that we don't trust the RFS stuff, it's just that, you know, there's a significant time lag.

- Cassilis

4.3 DELIVERY OF CATASTROPHIC FIRE DANGER MESSAGES

Online survey

Just under half of the survey respondents (46%, n=231) indicated that they received an official warning via SMS or telephone about Catastrophic Fire Danger in the Central Ranges, North Western and Greater Hunter Fire areas. High proportions of respondents who received an official warning about Catastrophic Fire Danger via SMS or telephone thought it was easy to understand (88%, n=197), timely (83%, n=184) and useful (78%, n=174). Respondents on residential blocks more often found the warning useful (84%, n=76) than those on large farm properties (70%, n=32) and hobby farms or small acreages (74%, n=62).

In response to receiving the warning, respondents most commonly discussed bushfire threat with family, friends or neighbours (62%, n=143) and looked for information about bushfires in their area (61%, n=141) (see Figure 8). Some got equipment ready to protect the house or property (38%, n=88) or began preparing to leave (38%, n=87). A smaller proportion (12%, n=28) indicated that they left for a place of relative safety after receiving the Catastrophic Fire Danger warning. 'Other' responses varied, with comments such as:

'Got action plan into place and waited for updates and online details.'

'Prepared other elderly family member in another household for



evacuation and their pets and belongings.'

'Got equine disaster team activated to support horse owners in the area.'

'Had to try and settle my daughter with mental problems as all the talk was scaring her.'

'Regularly checked RFS website and inspected property from lookout points. Fire units checked and in driveway.'

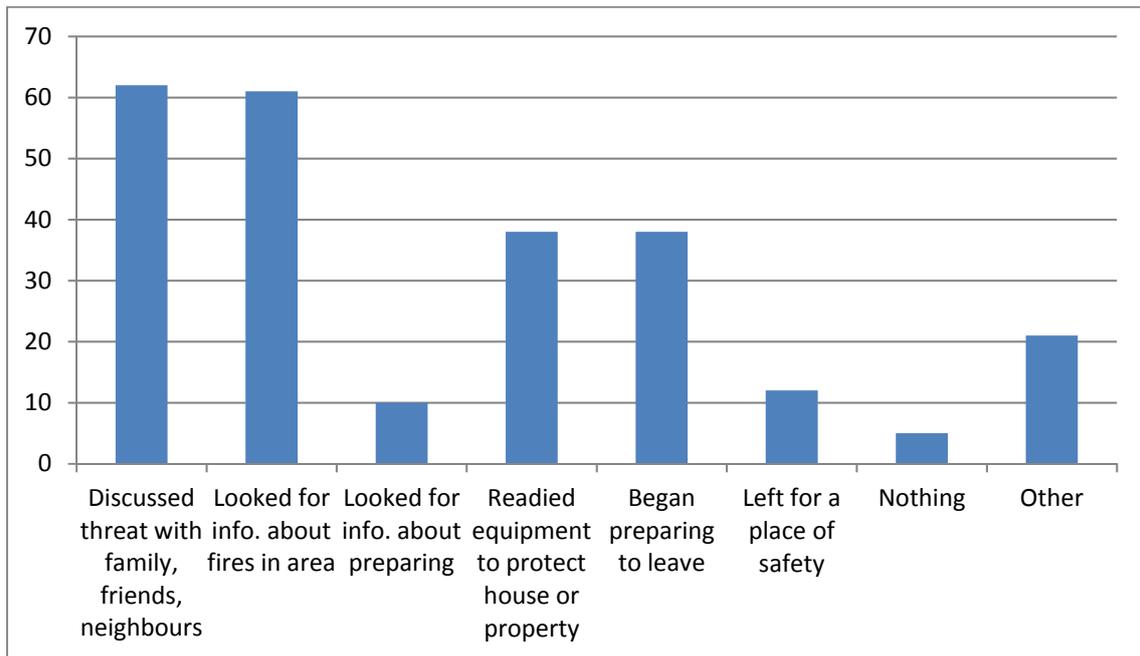


Figure 8: Response to Catastrophic Fire Danger warning (%)

When asked what they would do if a Catastrophic Fire Danger warning was issued for their area next summer, 12% of respondents indicated that they would leave before the fire and 24% said they would wait for a fire and then leave (Figure 9). 24% intended to wait to see if there was a fire before deciding whether to stay or leave. 27% indicated that they would get ready to stay and defend. 4% said that a Catastrophic Fire Danger warning would not influence what they did. Those indicating that they would do something else ('Other', 21%) mostly made comments such as 'enact plan', 'watch and act' and 'be ready to respond'.



Figure 9: Intended response to a Catastrophic Fire Danger warning next summer (%)

Figures 10-12 present intended responses to Catastrophic Fire Danger by gender, NSW RFS membership and property type. Results indicate that men are more likely than women to begin preparing to defend (36%, n=33 vs. 20%, n=27) once a warning of Catastrophic Fire Danger is received, while women are more likely than men to wait until there is a fire and then leave (32%, n=42 vs. 11%, n=10). Respondents who were NSW RFS members or ex-members more often said they would get ready to defend (38%, n=25 and 29%, n=6, respectively) than those who had never been members (21%, n=29). Those who had never been NSW RFS members were more likely than current and past members to intend to wait until there was a fire and then leave (30%, n=42 vs. 12%, n=8 and 14%, n=3). Respondents on large farm properties more often indicated an intention to prepare to defend than those on residential blocks and hobby farms/small acreages (38%, n=17 vs. 26%, n=24 and 23%, n=19).

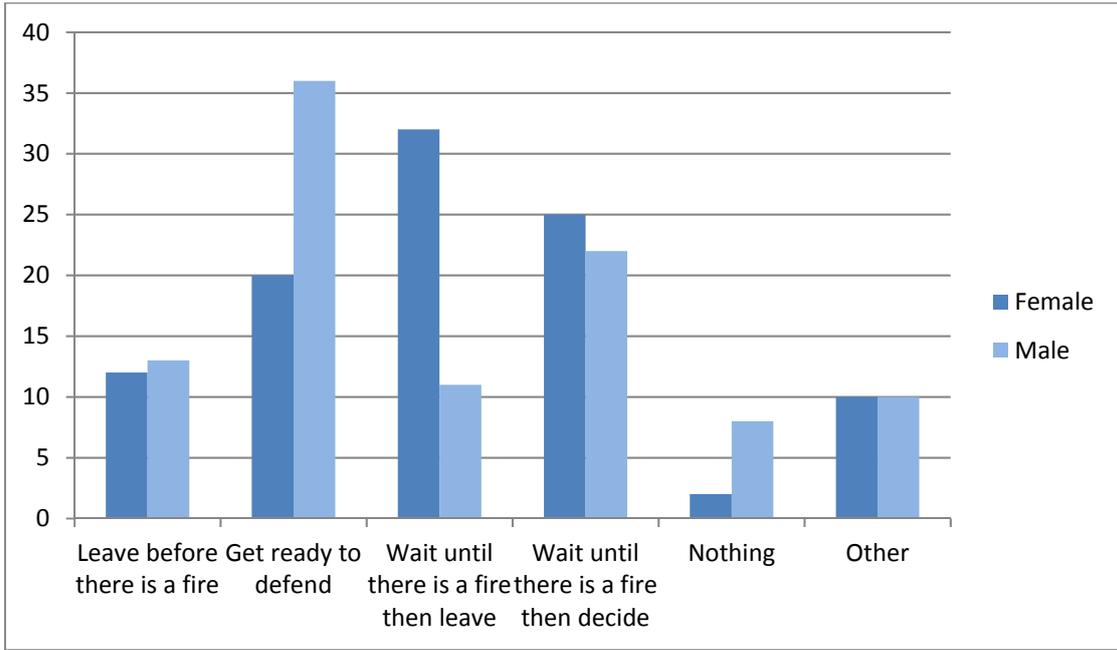


Figure 10: Intended response to a Catastrophic Fire Danger warning next summer, by gender (%)

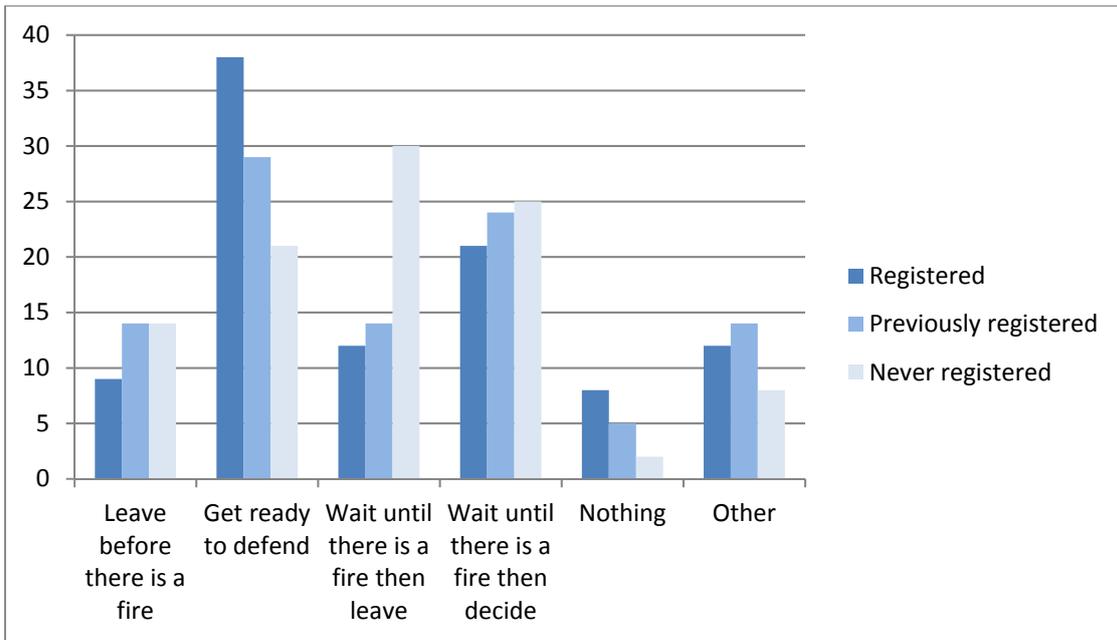


Figure 11: Intended response to a Catastrophic Fire Danger warning next summer, by NSW RFS membership (%)

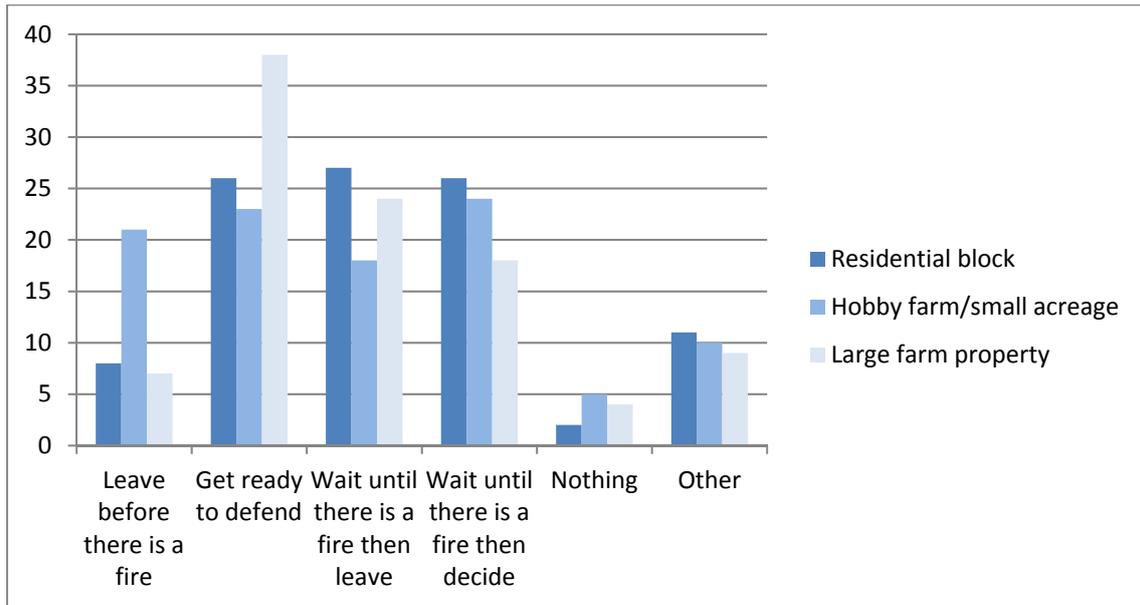


Figure 12: Intended response to Catastrophic Fire Danger warning next summer, by property type (%)

Interviews

Of the three fires studied, the Sir Ivan was the only fire to burn under Catastrophic Fire Danger conditions. Most interviewees were aware that Sunday February 12th was forecast to be a day of Catastrophic Fire Danger. Some had begun preparing as a result of the declaration, and some had considered how they might need to modify their normal behaviour:

It was a weekend; it was a catastrophic weather event. There's no need to take any risks. We'd had warning of it. Everyone could be on top of their stock water and the things that they needed to do. Like, nothing's that urgent that you could justify going out and causing a fire like this to start... If you see a catastrophic fire condition it's going to go hand in hand with weather that you wouldn't have a machine operating in a paddock.

- Leadville

We knew it was coming and going to be bad. They don't usually say it's catastrophic for nothing... We were kind of getting prepared half a week out, because it was going to be a bad day.

- Cassilis

Oh yeah, we were absolutely aware of it yeah. It was incredibly hot, incredibly hot and dry... I remember when we were driving home on Saturday afternoon, listening to, I think it was the New South Wales Bushfire Commissioner speaking on the ABC Radio, and he was talking about the conditions on Sunday, and about this wind arriving. He said it was over such a large area, and the temperatures were so hot, there was such a big fuel load over such a large area, that it was going to



be catastrophic. I remember him saying that there was no way that the resources they had would be able to respond to every fire. There was the potential of, if a fire did break out, it was going to get out of control very quickly.

- Dunedoo

Some interviewees were aware of the Catastrophic Fire Danger rating, but acknowledged that the warning had not really influenced their behaviour or their preparedness to respond to a bushfire:

Female: We did hear on the news about Sunday being like a Catastrophic risk day, which was well predicted. What we'd done, talking about fire readiness and that... In hindsight, no, we weren't ready at all. Didn't have a plan that would've worked...

Interviewer: So the Catastrophic warning didn't influence anything you did?

Female: Only to monitor it. No, not really.

- Coolah

Female: We got text messages... It said about the catastrophic conditions and they eventually told us: 'This place has been evacuated, and this place is being evacuated. Go somewhere'. And I was getting those messages on that Sunday morning about you know this is where the fire's at. You know. This is where to go. Blah blah blah. If you're in the bush get out. All that stuff. So yeah.

Interviewer: Okay. Were you doing anything to prepare the property on that Saturday?

Female: Saturday night? No, we were going into town, doing our usual thing.

- Cassilis

Despite being aware that there was a fire burning near Leadville, and despite awareness of the Catastrophic fire danger conditions forecast for Sunday, some interviewees could not comprehend that a fire could reach them:

I was [aware], but I don't know when. I can't remember when I learned that. Those warnings, they did get through... Yeah, we were aware of that. Even with knowing that it was catastrophic, we still didn't,



couldn't, wasn't within our minds to picture that that fire could travel that far.

- Coolah

Even Sunday we didn't think it would affect us. Because we went for a drive at lunchtime and we still didn't think that we would get burnt out. It was only when we went over to the neighbours and asked them... He said, 'It's going to wipe us out this afternoon... So you've got to stand and fight or get out'.

- Cassilis

In Uarbry, an interviewee described being unsure of what to do after receiving warning that a bushfire was imminent. He later evacuated when a police officer visited and advised him to leave. His house was subsequently destroyed in the fire:

Anyway so it's getting worse. The fire service and all these people are on the phone saying 'You gotta get out', it's catastrophic' and all the rest of it. And I'm thinking, "Bugger I don't know what to do."

- Uarbry

Some interviewees who were affected by the Sir Ivan fire reflected on how a Catastrophic Fire Danger rating might influence their responses in the future. Residents in Uarbry and Coolah explained that their plan for future bushfires is to stay and defend unless conditions are Catastrophic, in which case they would leave:

Interviewer: So, knowing what you know now, would you do anything differently?

Male: Everything. What I'll do is, when I can afford to buy a tractor again, I'm going to plant a 20 foot green [trees] round the house, because it might get up to where it'd get past that. I will have...

Female: Unless it's a catastrophic fire.

Male: If it's a catastrophic fire, whatever's left of the legal stuff like that, will be in the car, and we go.

- Uarbry



I think I am fairly well prepared, but catastrophic conditions I don't think you can [stay and defend]. As I said, you can have 25 trucks in your driveway and you'll still lose it. Basically not much else you can do....

- Coolah

Interviews with people affected by the Currandooley and Carwoola fires also provided insights into how people understand and intend to respond to Catastrophic Fire Danger. Some had clear plans to leave on Catastrophic Fire Danger days, but would only leave once a fire had started. Despite the relative infrequency of Catastrophic Fire Danger days, most interviewees thought it was unlikely they would leave in the absence of a fire. The following excerpts are typical of these discussions:

Female: If it was Catastrophic and I had the chance to get out with the kids, then I would, and I would probably try to encourage my partner to come, but I know he wouldn't. He would definitely stay regardless of the rating.

Interviewer: Even if there was no fire in the area, do you think you'd leave?

Female: If it was a catastrophic day and there was a fire, then I would leave. If it's a catastrophic day and no fire, I would probably stay. So as a precautionary thing, I probably wouldn't.

- Mount Fairy

Male: I know that when the Catastrophic thing came out of the Victorian bushfires... And, I understand why they do it, but from what I read and know through being in the fire brigade is that, if it's Catastrophic you should leave - whether there's a fire or not. I don't know if I agree with that, and I don't think you could convince a lot of people in the community to do that.

Female: I mean, if it was just a normal day, you'd go to work, the kids would go to school...

Interviewer: But if it was school holidays? Over summer? You wouldn't be leaving if there was a Catastrophic Fire Danger Rating without a fire?

Female: Probably not.

Male: I don't think so. If there was a fire, that's different.



Female: I don't think we would. I mean, I think you'd certainly be conscious of it, you would have it in the back of your mind, but I don't think we would go.

- Carwoola

Interviewer: Would you leave on Catastrophic days, even if there's no fire?

Female: Not going to happen. I think that's really unrealistic especially for people that have livestock. I've heard that and especially after Black Saturday because there was so much loss of life, that on a catastrophic day you should just pack and go if you're in an area of high risk, the logistics of that are just ridiculous. Like I said, if it was just people in a house, and it was a case of, "Oh, we'll go and stay at grandma's or we'll go and do whatever," that would be fine. But in a rural area like this where everyone has got other things, I think that's really difficult to do.

- Carwoola

In contrast, an interviewee affected by the Currandooley fire felt that she would follow the advice to leave on Catastrophic days, before there is a fire.

As far as I'm concerned I don't want to die in a fire. If that's the advice, yeah so be it. Go to the coast. I wouldn't have an aversion to it. I know [my husband] wouldn't. He would say that's ridiculous. Mind you, I'm now putting words in his mouth when he's not here but sure, if it's going to be catastrophic I don't want to be in the way. I'd rather be somewhere safe.

- Tarago

Others interviewed for the research had considered the risks on days of Catastrophic Fire Danger, but said they would not leave their house and would seek to enact their plan to stay and defend:

Interviewer: Would a Catastrophic day change your plan at all?

Female: I would not like that... Catastrophic means catastrophic, doesn't it? What can you do? A sprinkler isn't going to do anything, is it?

Male: Well it depends, if I was in the brigade, I would have gone and done that. Now that I'm not in the brigade, I can stay here. I feel relatively confident about doing something, based on what we've



had happen before. But then of course, the next time there may not be any tankers and they're all concentrating somewhere else.

- Tarago

In the event of a catastrophic warning I think we'd still stay and we'd carry out our plan anyway. I'm confident we would do that. But I think we would be a lot more nervous. We would be looking for things to go wrong. But then as I say, we're getting older, and sooner or later we're probably gonna get to a stage where we can't do this sort of stuff anymore, in which case we might have to go away, but that's gonna be a while down the track I think.

- Mount Fairy

Male: We don't take holidays in summer.

Female: We don't go anywhere in the bushfire season. If we go anywhere it's gonna be in the middle of winter.

Interviewer: The official advice is to leave on Catastrophic days before there's a fire – that's not something you'd do?

Male: No. There's 30 years of life in this place. Not gonna walk away from that.

Female: Quite happy to defend it. I think we've got most things in place to do so.

Male: On the really high fire danger days, you're conscious of the fact that you're almost sitting in a tinderbox. You certainly weren't in the 17th of February.

Interviewer: So did that influence your perception of the risk on the day?

Male: Yes, absolutely. As [name removed] said, I was downtown. I was at my yoga class for crying out loud. I would not go to a yoga class on a Catastrophic fire day!

- Carwoola

4.4 INFORMATION SOUGHT OUT RELATING TO THE FIRES

Online survey

In addition to warnings and information received from official sources, people sought out information about the fires from a range of sources. Respondents who were threatened or impacted by fire in 2017 most commonly accessed warnings and information via the Fires Near Me app or website (82%, n=198). Just over half accessed information via the internet (53%, n=127), most commonly about the location of the fire (91%, n=117), roads (e.g. traffic and road blocks; 64%, n=83) and weather conditions (60%, n=117). Around half looked for information about firefighting activities (54%, n=70). Analysis of survey respondents' comments suggests that most people accessed warnings and information via Fires Near Me, the NSW RFS website, the Bureau of Meteorology website and various Facebook pages (including NSW RFS and local community pages).

Six in ten (62%, n=149) respondents accessed warnings and information via social media. They were asked what the most useful 'official' or 'unofficial' information source was on social media. The most frequently used words in response to this open-ended question include 'Facebook' (39% of respondents, n=56), 'Local' (25%, n=36) and 'RFS' (22%, n=32). Twitter was mentioned by far fewer respondents (4%, n=6) than Facebook (see Figure 13).

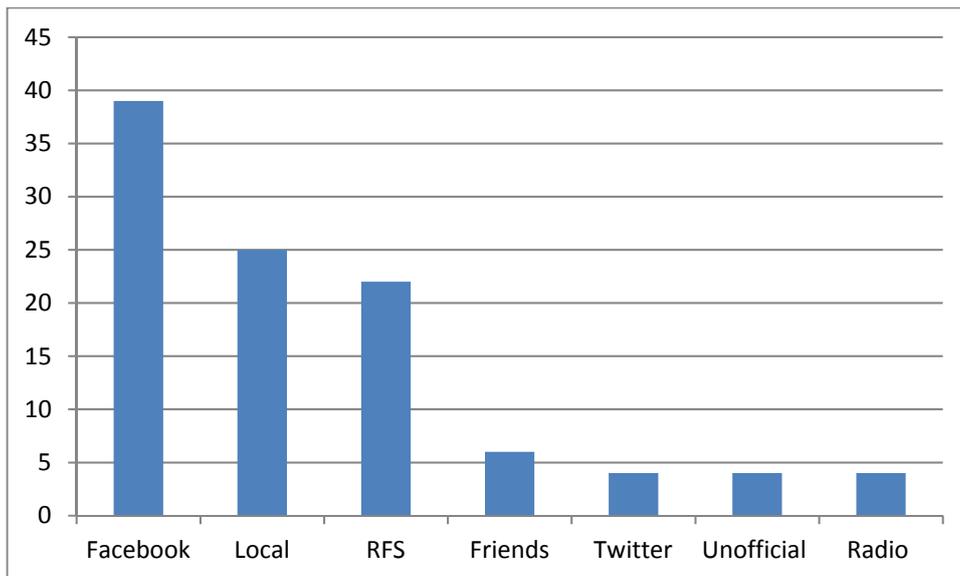


Figure 13: Words and phrases used by participants (%) when describing most useful social media source (n=143)

Just over one-third of those who were threatened or impacted by fire attended a community meeting (35%, n=84). The remainder indicated that they did not attend a meeting (53%, n=128) or that there was none in their area (12%, n=29). Most respondents found the information provided useful (78%, n=65) and discussed the situation with other neighbours or nearby residents (95%, n=77).

Interviews

As discussed in Section 4.1, interviews with residents affected by the Currandooley, Carwoola and Sir Ivan fires highlighted how most people began



an ongoing process of information seeking that included communication with others within the threatened area and information searches via the internet or smart phone applications. A key insight from the interview data is that many interviewees received notification of the fire and information relating to its location and direction and rate of spread, then sought visual confirmation in order to make their own assessment of the threat. Direct observation of the fire appears to have helped people ready themselves to begin defending, or confirmed the need to leave:

I was just looking. I had the Fires Near You [sic] app, watching it, keeping updated, going up to the top of the hill, driving down to the fire zone, just keeping an idea of where it is and what's happening.

- Cassilis

I actually saw the smoke when the fire first started. So I smelt the smoke and I drove up to where the fire started. You can see it from Taylors Creek Road. So I drove up to Taylors Creek Road and noticed that it was going to be a dangerous fire.

- Mount Fairy

Well, it was because the conditions were so bad, in that it was really hot, there was a lot of feed. I thought, 'I'm going to go just to have a look at this'. I drove down and had a look, down around the highway and I could see where it started behind Leadville village. I drove the other side and up to Coolah and back home again and I thought, well it's not a big fire, the conditions are crook, but I think they'll get that. They'll probably get that tonight when it cools off and that was sort of my assessment of it on that day. The next day, that was the day before it come through here and it got bigger from there.

- Dunedoo

Interviewer: How were you getting information about where the fire was?

Male: Only information I got was going and having a look for myself, in knowing where the fire was and which way the wind was blowing. So I knew where it was and which way it was gonna come.

Interviewer: Did you actually get in the car and go down and have a look?

Interviewee: Yeah. On Saturday.

- Cassilis



One of the firies came in here, and he said, "Is there any point at a high place that we can take a look to see what's happening?" And I said, "Yeah, at the back here, there's a high vantage point where you can see right around the back there." And we went up there, we could see the flames just starting to come over the hill, way at the back there. And there was more [fire] going up the valley that way, but it was creeping back this way. And he said, "I think you're going to be all right here. You're going to be pretty good here. Looks like it's all going up that way." Anyway, he left and I came down here and we all went back up there, and the boys were up the hill, watching it. And I looked up at the trees and the wind had changed, and it was heading straight this way.

- Carwoola

[Name removed] and his grandson went up the road to see where it was... So for them it was all big excitement, the way it is for the male of the species. I mean, I probably would've been interested too, but I was also like a scaredy-cat. So yeah, they went off and returned back.

- Location withheld

UHF radio was an important communication channel for some agricultural landholders, particularly in areas where mobile phone reception was limited or down. Many landholders affected by the Sir Ivan fire used UHF radios in the vehicles to communicate with others while they were out fighting the fire:

The UHF was good because I have one in my Ute... We all tune into this home station and just keep relaying information that they were getting from their parents or from the RFS blokes that were at their place. We were getting it first hand, the whole thing... It definitely kept us on top of where the fire was and how immediate the danger was.

- Cassilis

Interviewer: What other sources of information were you seeking during the fire?

Male: It was mainly UHF and driving. Going out and seeing what was where. When the mobile network went down, it made it extremely hard. UHF's made it possible to communicate.

- Coolah

We've still got a repeater station through UHF. It used to be that everyone had their own channel and you sort of knew your



neighbour's channel and then when there was a crisis, we went to the repeater so everyone went on the one channel. Because a lot of that, when we were fighting fires, with our utes and slip ons, we weren't communicating enough because everyone was on a different channel. And it sort of took a while to get everyone on the same channel... no mobile service.

- Cassilis

Just because of the mobile service. You can literally have service here, walk two minutes and nothing. Yeah, if we're going to have these sort of things, we need better mobile reception. The amount of black spots is dangerous... Everyone has got a UHF around here and it sort of instantly goes out over the repeater. Everyone hears. Everyone acts on how it happens.

- Leadville

There were a lot of privately owned vehicles, and people, most of them had UHF's in them. And they would've been on their own personal channels, a lot of them. A lot of them would've been on our channels, which was good because I knew where they were and what they were doing and I could direct them as well.

- Leadville

Again, these data highlight the importance of local social networks in the dissemination of warnings and information. People tend to engage in an ongoing process of information seeking and sharing, preferring information that is highly localised and from local, trusted sources. The following excerpt from an interview with an agricultural landholder in Dunedoo illustrates the challenges that confronted many residents when seeking information during the bushfire. It also suggests that mobile phone network coverage and telecommunications outages may contribute to people travelling to look at the fire or communicate with other people:

It's such a fluid situation, and that's one of the big things, that the mobile phone service is just rubbish around here, it makes it so difficult to do things, and things are changing all the time. Then even if you get a bit of information, you're not really sure that it's right. There's so many rumours going around, and you're only looking at your little bit of the fire, you're not really sure what's happening in other places.

- Dunedoo



4.5 DRIVERS AND MOTIVATORS FOR RE-ENTERING FIRE GROUNDS

Online survey

Six in ten respondents (60%, n=149) were at home when they found out that a bushfire was threatening. Of those who were not at home (40%, n=99), almost three-quarters indicated that they attempted to return (71%, n=67).⁴ Analysis of respondents' comments suggests that the main reasons people returned were to defend houses and property, to assist or rescue other household members, and to protect pets and other animals. Detailed findings related to people's protective responses are presented in Section 4.7.

Interviews

Analysis of interviews with people affected by the Currandooley, Carwoola and Sir Ivan fires illustrates the many and varied reasons people returned to fire affected areas. As noted above, people's desires to return most often revolved around their intentions to protect houses and property, rescue vulnerable people, and protect animals. In each of the fires there were people who were delayed or prevented from returning by road blocks. Road blocks were a common source of frustration among interviewees, particularly those affected by the Currandooley and Carwoola fires:

[Name removed] said, it would be a good idea for someone to come back to keep an eye in case some of the glowing timber would start burning again. I said, "Okay I'll go home." Didn't get further that Cairns Parade, and I was really pissed off then because ... I actually swore at the cop, just couldn't understand that I couldn't get in. I wasn't someone sightseeing or something, I wanted to save my place.

- Carwoola

And all we wanted to do was get our freedom. We had chooks, birds and they're um-ing and ah-ing about whether to let you in or not.

- Carwoola

But it made me think that my reaction was, why have I bothered investing in fire protection if when a fire occurs I can't get in to utilise the equipment I've put together? That was my concern. And of course, that causes a bit of a problem between people like myself and the authorities.

- Mount Fairy

One interviewee threatened by the Carwoola fire suggested that information that was broadcast on ABC radio may have motivated some people to return.

⁴ This figure is calculated from 95 responses (four respondents did not answer the question).



He believed that interviews recorded with residents earlier in the day were being rerun, giving residents who had not yet returned the impression that they might be able to do so:

They were also falling back into the old radio trick of when you've got dead air, then you rerun interviews. And at various times she was asking people can you phone in to tell us what you can see from your property now. Well, anyone with brains wasn't doing that because they were too busy out there actually working the property... It was giving false hope. Because there were a lot of people who were jammed at the roadblock down there. There were a lot of people who were trying to get out of Canberra to come home. And we could hear them because they were calling into the station, and they were saying, "I'm just driving home now, and I don't know if I'm going to get through to my property."

- Hoskinstown

One Carwoola couple explained their deliberation about whether to return from Canberra. A thorough assessment of their property and their capability to defend it had led to their 'firm' plan to leave or stay away from their home if threatened by bushfire. Despite this, they were tempted to return to see what they could do:

We felt really helpless and we felt guilty that we weren't doing anything. We actually questioned whether we were doing the right thing because we felt for all our neighbours... We entertained the idea [of returning] but it wasn't going to happen. I was quite firm, I said: 'There's probably not a lot that we can do'. We understood that things became quite chaotic, there was a lot of traffic, it was very smokey. When the fire trucks started to come in, it was pretty full on. We reasoned that it's probably good that we weren't here. I don't know if that's right or not. I do sometimes wonder that maybe if we had of stayed and defended, we might have somehow prevented the severity of the fire for other people.

- Carwoola

Other people did try to return, only to find themselves stopped at road blocks. While some complied with the road blocks, others described how they passed through or circumvented them in order to return. The most frequently discussed example of this involved a Carwoola resident who returned from work and asked to be let through the road block so he could reach his elderly father and young child. After being told that he could not pass the road block he went on foot through paddocks to circumvent it. He explained:

If you stop someone, then you take the duty on for what they were going to do. If it's saving a life... So that's what I thought: 'If you're



stopping me, you're taking that duty of care on'. 'No? You didn't [take it on]? Okay, well, I'll take it. I didn't like taking the risk that I did take. And it was a risk. And my wife didn't like it either. But it was what I was willing to do to get back to them. So it wasn't about saving the property, it was about making sure that they were okay.'

- Carwoola

Other interviewees also described how they circumvented road blocks. In addition to running through paddocks, some used gates and roads through private property to go in 'the back way'. Interviewees described returning on foot or in vehicles that were unsuitable for backroads, tracks and paddocks.

They said 'You cannot get through' and I just said 'We've got kids at home...' Yeah, I told the police that. Which wasn't a lie because I have goats.

- Tarago

We were in town when the fire started... You'll hear a lot of gripes about the police blocking off the road. We stayed there [at the road block] for a little while, but then, because we've got sheep and livestock, we are in habit of using our back neighbour's shearing shed, and so I took my Sedan, car, not built for it, back through in our neighbour's place. I remember a tractor we use and now use with four wheel drive, I remember a creek crossing, which was very rocky, scraped the car a bit, but we got home.

- Carwoola

My wife arrived, she tried to get through, just to go get them and get them out, because there was no fire here at this stage. It was all pretty much to the west, really, in that area there. But they wouldn't let us through. After about 45 minutes of waiting there, I decided enough was enough... I parked my car in the quarry up the road there, got my wife to drive me down the road about four kilometres on Captain's Flat Road, and then I ran across on foot, so I could get home.

- Carwoola

Another interviewee managed to convince someone who had access to the fire ground to 'sneak' him through. Once he was inside the road block he was unable to leave for fear of not being let back in again. He arranged for his adult children to bring supplies to the road block in order to pass them over to him:



Male: I actually managed to sneak back in... I had some assistance, let's say.

Interviewer: Someone on this side brought you over?

Male: Correct. Someone who had access to this side brought me through. I'm telling you, we're rightfully indebted to that guy... When they kept them out down here [at the road block] on the Saturday morning [the day after the fire], my kids were ferrying stuff. They'd drive up to the line, pass the stuff, we'd drive off. Then the guys [on the road block] are saying 'The power lines are down'. 'Look, if the power lines are down, they're not down between me and there. Why are you not letting people in?'

- Carwoola

Road blocks were also an issue in the Sir Ivan interviews, although to a lesser extent than for Currandooley and Carwoola. An agricultural landholder at Dunedoo explained how a police road block had been set up nearby and that his son had had to come through a back road through dense scrubby vegetation. He believed that his son had been exposed to considerably more risk than if he had passed through the road block and lamented authorities' attempts to control people's access to his property:

My son wanted to come home... There's a road through the scrub there, and Sunday morning he came down. He was told he couldn't get down through the road, so he came down through the scrub. You imagine if he broke down. He would have burned and died. Because the arterial road... they blocked it. People will find their way through, and I will tell you I will be one of them. If I get told not to go through there, I will go through it, I will go round, because they don't know. I do know. I've been fighting fires all my life. I know what I have to do, and I know how to manage situations and people and things. I don't want to be told by someone with a badge that I can't look after my family property or whatever... [If] people come in, right, 'Who are you? Where are you going? How long are you going to be there?' Make a register, whatever, let them know the risks... If they put a block on it, straight away they will lose control because people will find other ways. I think that's a really important thing. That's one thing they could have done better.

- Dunedoo

The idea that property owners should be able to decide whether they return to their homes and properties was shared by a number of interviewees.



Owners of property should have the opportunity to make the decision themselves, whether they want to go and fight, or whether they think it's safe enough. But just to lock somebody out and say, "Nope, you can't go home," and they've got the opportunity of losing their animals, their pets, their house, everything else, I just think that's not right. They should stop and talk to people instead of just saying, "Nope, road's closed," they should ask a few questions. "Are you prepared? Have you got firefighting equipment? Can you move your animals without any risk?" And they should have the opportunity to make the decision themselves.

- Mt Fairy

My point is, to tell the copper this is my address, this is my registration number, I'm going in to get my daughter. If I'm not, I'm staying and fighting. That's what I'm saying. There was none of that possible to say, 'I'm going in. You've got my licence, you know where I am and where I'm going. I'm prepared if something happens, I'm going to be with her.'

- Carwoola

An interviewee at Carwoola believed that the public discontent with the road block had been at least partly caused by poor communication. He believed that NSW RFS personnel should be present at road blocks to take the pressure off police and provide information about the fire and the road block to the public.

There needs to be someone there giving everybody as a community an understanding of what's going on. There's no thought about the general public psyche at that time, they've [RFS has] got to be there controlling it. Take the pressure off the policeman... I rang him two weeks after the fire, and I eventually got through his superiors and I said, "I'm just ringing to thank you for what you did. You didn't give me what I wanted [to get through the road block, but your conduct on that day was absolutely amazing." That he held his nerve, that he held his temper, incredible. That pressure shouldn't have come on him so much. He was there on his own. RFS should have had someone there... What that sort of thing does is creates a situation where people break the law. People run a roadblock, they go and drive through someone else's property to get to where they've got to go. They put themselves in danger, because they feel forced to do it, because there's no alternatives. Present some alternatives, people will calm down...

- Carwoola



Despite widespread criticism of road blocks, particularly in Carwoola, there were residents who understood their purpose and felt they had contributed to the most important outcome - that no lives were lost in these fires:

I strongly believe, and I know others would disagree with me, in the precautionary principle. In other words, do not let people through, because you do not know what's going on, you are dealing with an unknown, and you let them through at your peril. They may get through, and you may cause deaths as a consequence, so the precautionary principle then is sensible... The end result of all this is to the best of my knowledge, that although it was inconvenient, and although it was worrying and all the rest of it, there were no deaths and there were no injuries.

- Carwoola

No one lost their life and I think that's the important thing... I feel, particularly, for one family that had grandparents and child at home, and I feel their frustration and their anger and their pain. And the fact that somebody took off on foot is a demonstration, a practical demonstration, of that and that's a problem that we've got to make sure never happens again. But the policeman keeping people out of there is what contributed so much to keeping everyone alive.

- Carwoola

4.6 PERCEPTIONS OF RISK

Online survey

The online survey results suggest high levels of awareness of bushfires prior to the 2017 NSW fires. However, it is important to recognise the possible influences of self-selection bias (i.e. people who are aware and interested in bushfires being more likely to participate in the survey) and hindsight bias (where outcome information influences people's recollections of their prior knowledge or beliefs) on these results (Bradfield and Wells 2005).

The majority of survey respondents indicated that, at the beginning of the previous summer, they thought it likely (36%, n=195) or very likely (46.4%, n=255) that a bushfire could occur in their local area. Few thought it unlikely (8%, n=45) or very unlikely (7%, n=39) that a fire would occur.

Perceptions of the threat posed by bushfires to property were more varied. Just under half rated the threat at the beginning of last summer as high (28%, n=151) or very high (20%, n=107) and almost one-third (29%, n=155) rated the threat as moderate. Two in ten respondents considered the threat to be low (17%, n=94) or very low (6%, n=30) (see Figure 14).

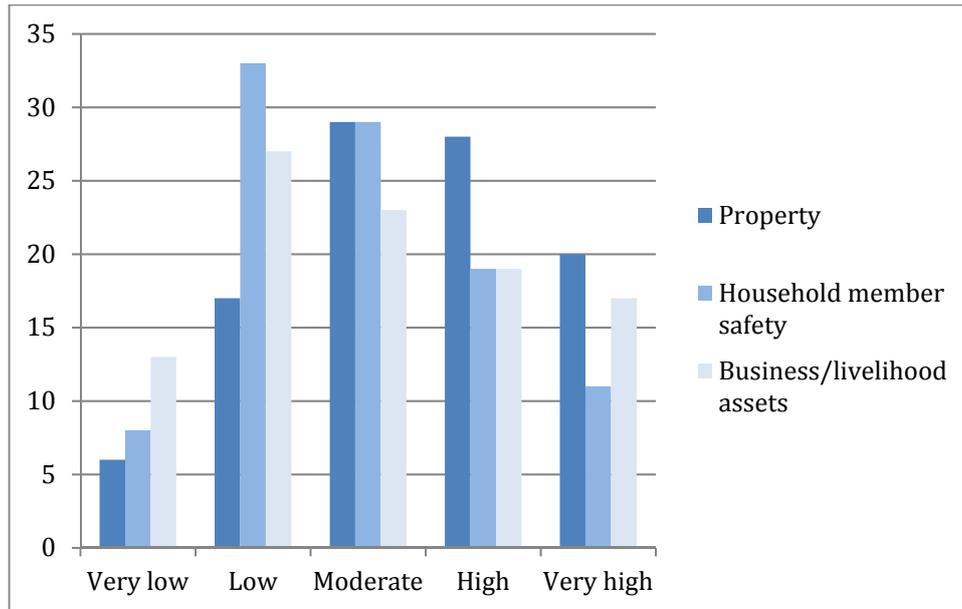


Figure 14: Perception of threat posed by bushfires to property, household member safety, and business or livelihood assets (%)

Just under one-third of respondents rated the threat to household members' safety at the beginning of last summer as high (19%, n=103) or very high (11%, n=57) and a similar proportion assessed the threat as moderate (29%, n=157). Four in ten respondents thought the risk to household members' safety was low (33%, n=177) or very low (8%, n=44).

Of those who had business or livelihood assets at risk from bushfire, four in ten perceived the threat to these assets as low (27%, n=116) or very low (13%, n=56) and one quarter perceived a moderate level of threat (23%, n=101). Just over a third perceived the threat to their assets as high (19%, n=80) or very high (17%, n=72).

Figures 15-17 present threat perceptions to property, household member safety and business or livelihood assets for residential, hobby farm/small acreage and large farm properties. Respondents on large farm properties more commonly rated the threat to property as high or very high (62%, n=52) than those on hobby farms or small acreages (52%, n=105) and residential blocks (42%, n=92). Conversely, those on residential blocks more often rated the threat to property as low or very low (32%, n=77) than those on hobby farms or small acreages (18%, n=37) and large farm properties (10%, n=8) (see Figure 15).

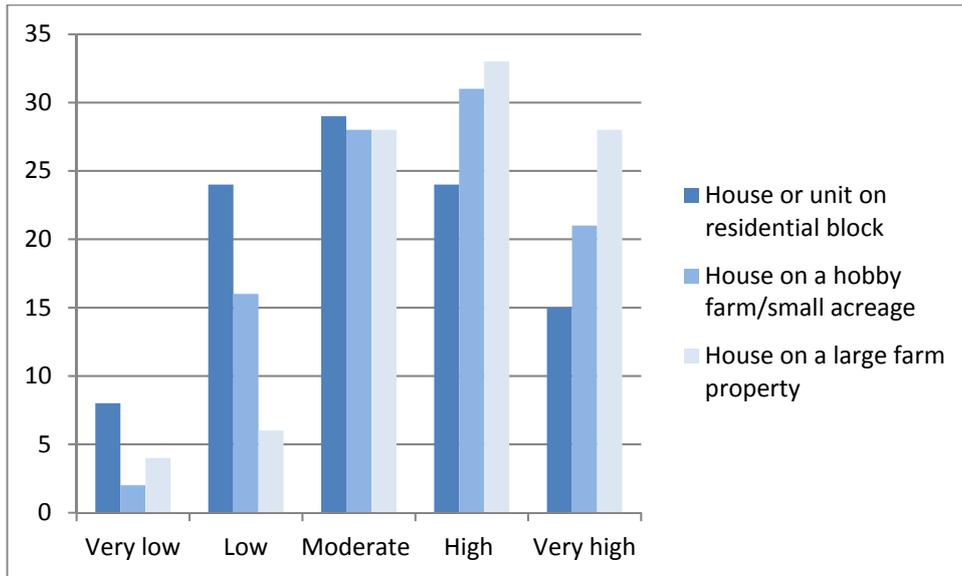


Figure 15: Perception of threat posed by bushfires to property, by property type (%)

Respondents on residential blocks more often rated the threat to household members' safety as low or very low (61%, n=109) than those on hobby farms or small acreages (40%, n=80) and large farm properties (32%, n=27) (see Figure 16).

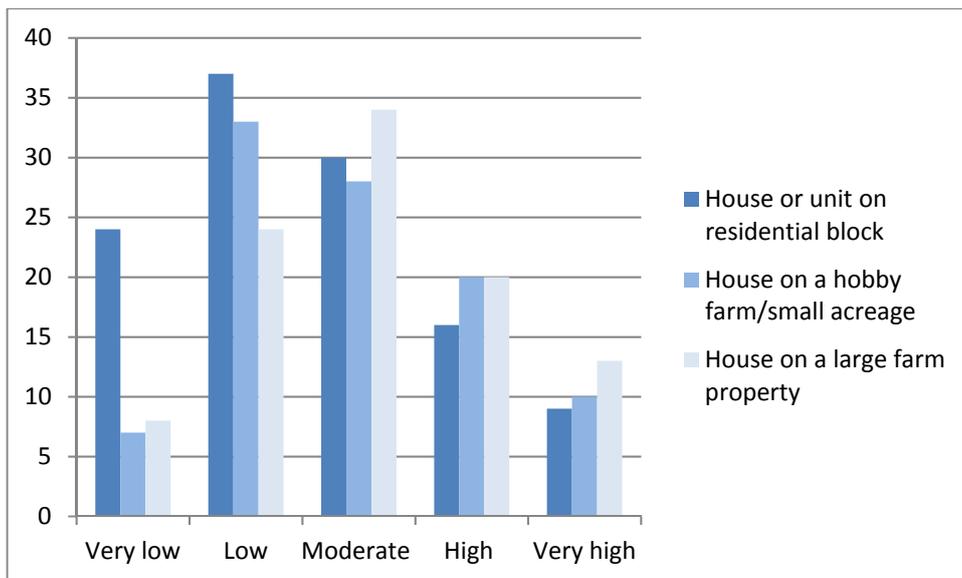


Figure 16: Perception of threat posed by bushfires to household member safety, by property type (%)

Respondents on large farm properties more often rated the threat to their business or livelihood assets as high or very high (58%, n=47) than those on hobby farms or small acreages (36%, n=61) and residential blocks 23%, n=38) (see Figure 17).

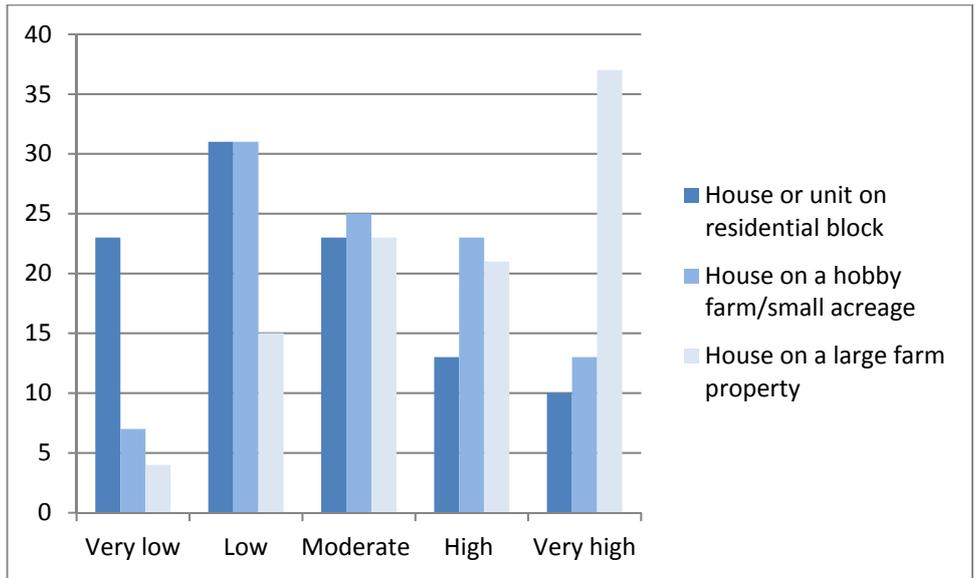


Figure 17: Perception of threat posed by bushfires to business or livelihood assets, by property type (%)

Interviews

Interviews with residents provided many insights into how people understand bushfires and perceive risks. In the Sir Ivan fire, many people did not anticipate the size and severity of the bushfire because there had not been large fires in the area in their lifetime. In the Currandooley and Carwoola fires, evidence suggests some people underestimated the risks to life and property posed by these fires because fire danger conditions were not ‘Catastrophic’.

The Sir Ivan bushfire was preceded by a ‘good’ winter and spring, with agricultural properties benefiting from ample rain. These rains contributed to an abundance of fuel on agricultural properties, and most interviewees were aware that this had increased risk if a bushfire were to start:

Like the fuel loads. I started saying, spring last year that we're going to have a bad fire season... If you drive around, have a look at the sides of the roads now, you imagine that sort of fuel load all through all those paddocks...

- Leadville

We hadn't had a big fire here for a long time... I guess but I saw a lot of signs I didn't like, in that we had a lot of standing feed... The neighbour on that side, he's got this beautiful cropping area, and he had cereal crops in that were ripening over the summer period. So I could see there's going to be a lot of stubble standing for a big area, and fire goes through that stubble pretty fast.

- Cassilis



Some landholders recognised the risk that a fire burning under Catastrophic fire danger conditions could pose, particularly given the abundance of fuel:

If their forecast of temperature, humidity, and wind [was correct], and knowing the fuel on the ground, yeah, I knew it was going to be bad. If someone, if something lights up, we're going to be in trouble. I guess there have been periods over the years but I can't remember anything quite as serious as that day. It was a shocker, totally... Just a combination of all those factors came together.

- Cassilis

Others, however, had not experienced a large fire in the area and did not anticipate the size or severity of the fire. Some interviewees referred to their experience with smaller, less threatening bushfires, which they believed were 'normal' for the area. They often explained that they were prepared for a normal bushfire, but not for a fire of the size or severity of Sir Ivan:

In my experience in this district, that's the sort of fires we have: everyone will swarm around it, [afterwards] somebody will go into town and get a couple of cartons of beer, we'll stand around and have a few beers. Somebody will bring out some sandwiches... Then somebody who's unlucky, generally the property owner, will have to stay out there all night checking it's not getting away. Most of the time fires around here, well in my experience, they've never been like this one. I'd never thought the whole place would go...

- Dunedoo

We never honestly for a second even thought that it would ... Maybe a little grass fire but not the severity that that was. But after talking to locals that have grown up here since they were basically born, there's never been a fire [like that] go through the region

- Leadville

I'll be completely honest with you, neither of us thought that a fire of that scale could go to the farming country where we lived. We were lucky that it reached us at the time of day it did, I suppose... [Why?] Just because it's just open farming country. There's not a lot of timber or scrub on that farm and I suppose down that valley. It was just that wind and that storm that it created, that it didn't matter how much fuel was in front of it, it just kept going... There's a big difference between a bushfire and that fire.

- Coolah



I mean the normal bushfires, localised sort of thing, you know you're ready for that, but what happened over there, I don't think anybody was...

- Coolah

Some interviewees affected by the Sir Ivan fire believed it was unlikely that they would experience another major bushfire in their lifetime:

We've been here for 55 years, we'd never had a fire. The chances of us getting another one are probably pretty slim, but I'll be thinking about insurance next time for the stock and the fencing.

- Cassilis

I'm confident now that if a fire came through again, I'd be quite safe being here at our house. I don't think we'll ever see a fire like that again in my lifetime. I know I could have survived here, when that came through, so any other fire which comes through, which won't be of the same magnitude, yeah, I'd be quite happy to, I'd be quite happy and confident just to stay here and look after things here.

- Dunedoo

In Carwoola, many residents were aware that there had been a significant bushfire in the area in 1985 and, due to their proximity to Canberra, many remembered the 2003 Canberra bushfires, which killed four people and destroyed over 500 houses (see Section 4.9). Locally, there was considerable concern about the amount of tea tree vegetation and the risk this would pose in a bushfire:

And probably our biggest worry is the tea tree that was next door. We're close to the boundary, and that's our choice, but not this bloke so much but previous owners hadn't bothered and the tea tree even back in 85, nobody cleared it. And of course once the fire gets into that, it just explodes.

- Carwoola

We did as much as we could in the past with slashing, you slashed around the tea tree and everything in the back paddock, which is where the fire would come from apparently. Not enough, it was just too fast, too hot.

- Carwoola



It was a warm summer's day. There was a bit of wind but it wasn't terribly strong. This was a bad fire because the wind did pick up a little bit and it got into all of that tea tree. And there's a lot of houses among all of that tea tree. We got exactly what we expected to get.

- Carwoola

While most residents appeared to be aware of the risk posed by bushfire in the Carwoola area, many did not feel that the weather conditions experienced on the day were particularly bad. Numerous interviewees commented that it wasn't a particularly hot or windy day:

That day wasn't even really high on my radar in terms of fire danger. It was a hot day, and there was a bit of wind, but it wasn't Catastrophic. It wasn't like two or three weekends prior to that when it was 45 degrees and blowing a gale. It just proves that accidents can create a big fire.

- Carwoola

We know that if it was a Catastrophic day, it would've been a very different fire we experienced. But with this fire, it was only Severe or Extreme, and we weren't terribly worried because there wasn't much wind. It just didn't seem like a bad bushfire day, even though it was a Total Fire Ban...

- Carwoola

It was not a firestorm scenario... It only really took off once it got into the timber as it headed toward Widgiewa [Road]. If you think about the extreme conditions of high winds, really low dewpoint, all the bad stuff that you can have, it wasn't that sort of a day. But the fire, nevertheless, was unbelievably intense as it went.

- Carwoola

That's the thing, because that day wasn't a bad day. We all wouldn't have thought it was a fire day.

- Carwoola



Male: It wasn't any worse than any other day. I mean, we were complacent... The other fire came in February, and we had no rain since November. This one we knew there'd been a bit of a shortage of rain, but, the temperature hadn't been as hot, and so...

Female: And the morning of that day wasn't particularly windy, which is why we went to town.

- Carwoola

An interviewee at Mount Fairy described seeing smoke from the Currandooley fire while driving into Canberra for an appointment. This interviewee was not particularly concerned about the fire, which at that stage was only kilometres from the house. Despite there being a vulnerable household member home alone, the interviewee did not believe the fire would reach the house, and continued on.

I was heading to Canberra between 1030 and 1100am... I noticed the immense amount of smoke, wild wind, and thought to myself, that doesn't look good. And I was going to give [name removed], who was here at the time, a call... just to alert [gender removed] there's a fire in the distance... [Explains why person was vulnerable]. I then found that I'd left my phone at home. I thought, it's probably just as well; it saves her going into freak mode. Off I went to my appointment. After the appointment, which was around 2pm... there was a new alert about the fire out this way. I went onto the RFS site and I thought, Oh my god, is [name removed] in one piece or not?

- Mount Fairy

In contrast, there was one interviewee in Carwoola who had taken notice of the damage caused by the nearby Currandooley fire, just a month earlier, and observed that it had occurred on a day of 'Very high' fire danger. This observation had contributed to her awareness and vigilance on the day of the Carwoola fire:

I should add that we weren't checking the app so much before the Currandooley fire, that we only saw what happened with the Currandooley fire, and that was a very high day. I realised that, "Wow, you can have these really destructive fires on days, which were only rated very high." So, we became more vigilant in checking the apps and also sticking our head outside the door as well.

- Carwoola



4.7 RESPONSES BY THE COMMUNITY AND PRIORITISATION OF PROTECTIVE RESPONSES

Planning and preparedness

The majority of survey respondents indicated that, at the beginning of last summer, they had a firm plan for what to do in the event of a bushfire (57%, n=306). Almost a quarter (23%, n=122) had decided what they would do and were thinking about to make it work. Relatively few respondents reported that they were still deciding what to do (6%, n=34), decided they didn't need to do anything (4%, n=24), knew they should think about it but hadn't (4%, n=21) or had never thought about what they would do in a bushfire (2%, n=9) (see Figure 18).

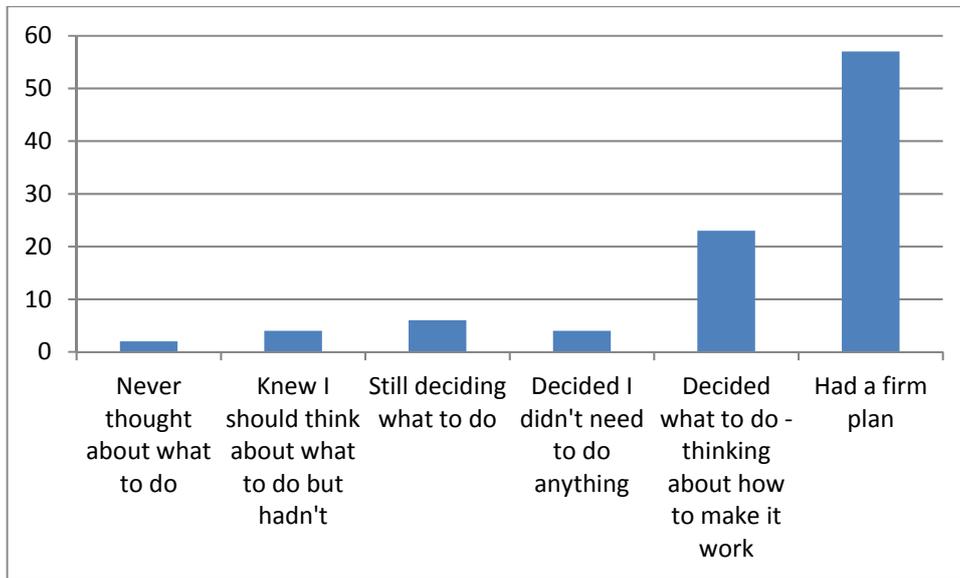


Figure 18: Level of planning for bushfire (%)

Most survey respondents reported that they had read the NSW RFS Guide to Making a Bushfire Survival Plan (71%, n=384) (see Figure 19). 22 % of respondents (n=117) had not read the Guide and 7 % (n=38) could not recall. Those who read the Guide most commonly used it to discuss what to do in a bushfire (58%, n=247) or write down a plan (18%, n=75). Other uses of the Guide specified by respondents (5%, n=22) mostly related to discussing what to do with other household members and developing plans. A small number of comments expressed a view that the Guide was not helpful, with reasons provided including that the document was not relevant to people in rural or country areas:

'It didn't really apply to us in the country'

'Not relevant - more for Blue Mtns area'

'Threw it in the bin! I can't believe people need it.'

'We all just made our own plan never seen one of the bushfire plans'



things in my life'

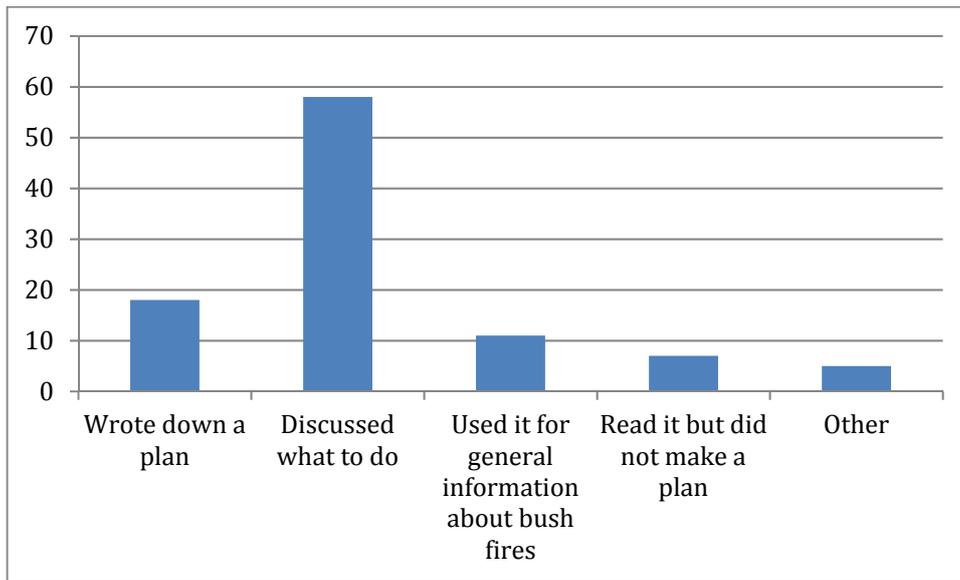


Figure 19: How Guide to Making a Bushfire Survival Plan was used (%)

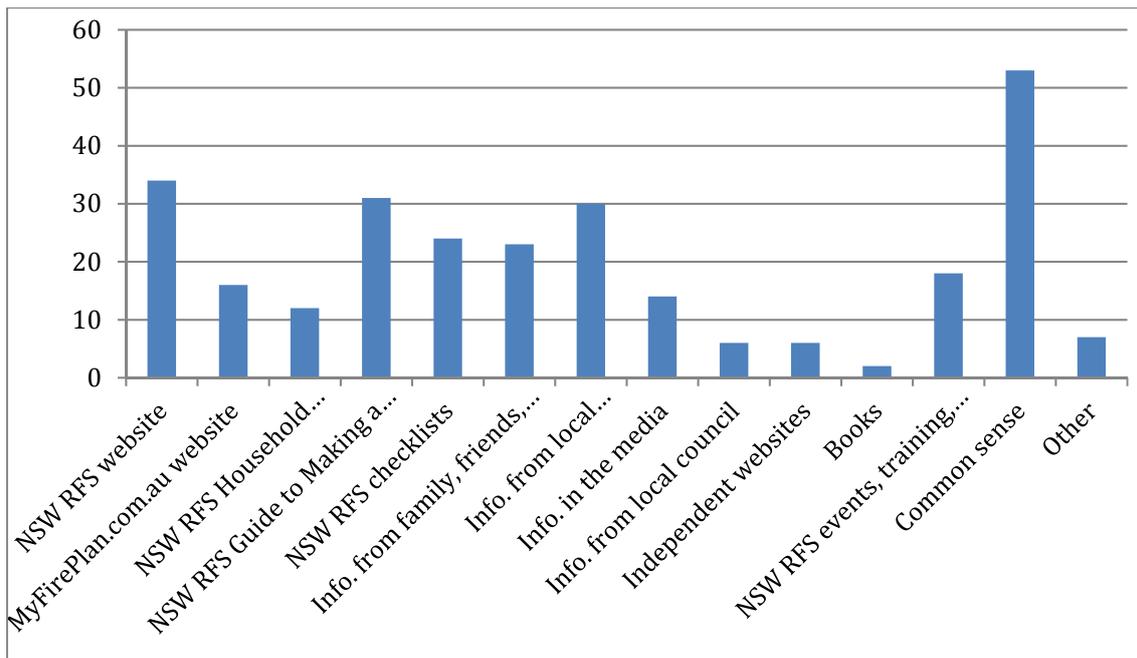


Figure 20: Information sources used to prepare a plan (%)

Respondents most commonly reported using 'common sense' to prepare their plan (53%, n=289) (see Figure 20). The NSW RFS website was the most commonly cited information source (34%, n=186), followed closely by the NSW RFS Guide to Making a Bushfire Survival Plan (31%, n=172) and information from local brigades or firefighters (30%, n=164). One quarter of the respondents obtained information from NSW RFS checklists (24%, n=129) and family, friends or neighbours (23%, n=124). Slightly fewer reported accessing information via NSW RFS events, training and programs (18%, n= 98), the MyFirePlan.com.au website (16%, n=89), the NSW RFS Household Assessment Tool (12%, n=68) and the media (14%, n=77). Very few



respondents sought information from local councils (6%, n=33), independent websites (6%, n=30) and books (2%, n=10). 'Other' information sources (7%, n=38) commonly included references to past experience with bushfire and volunteer firefighting or emergency management training.

When asked what about their fire plan at the beginning of the previous summer, one third indicated that their plan was for all household members to leave (32%, n=166) and one-fifth reported that some household members intended to leave and others stay and defend (21%, n=114). There were only 44 households (8%) where all household members intended to stay and defend. Very few households had plans involving sheltering, with only four respondents reporting an intention to shelter in an undefended house. Twelve households (2%) had plans for some people to shelter while others defended. Significantly, one-fifth reported an intention to wait and see what the fire was like before deciding what to do (21%, n=113). Based on these figures, 54% of households had plans involving leaving/evacuation and 34% had plans involving property defence (see Figure 21).

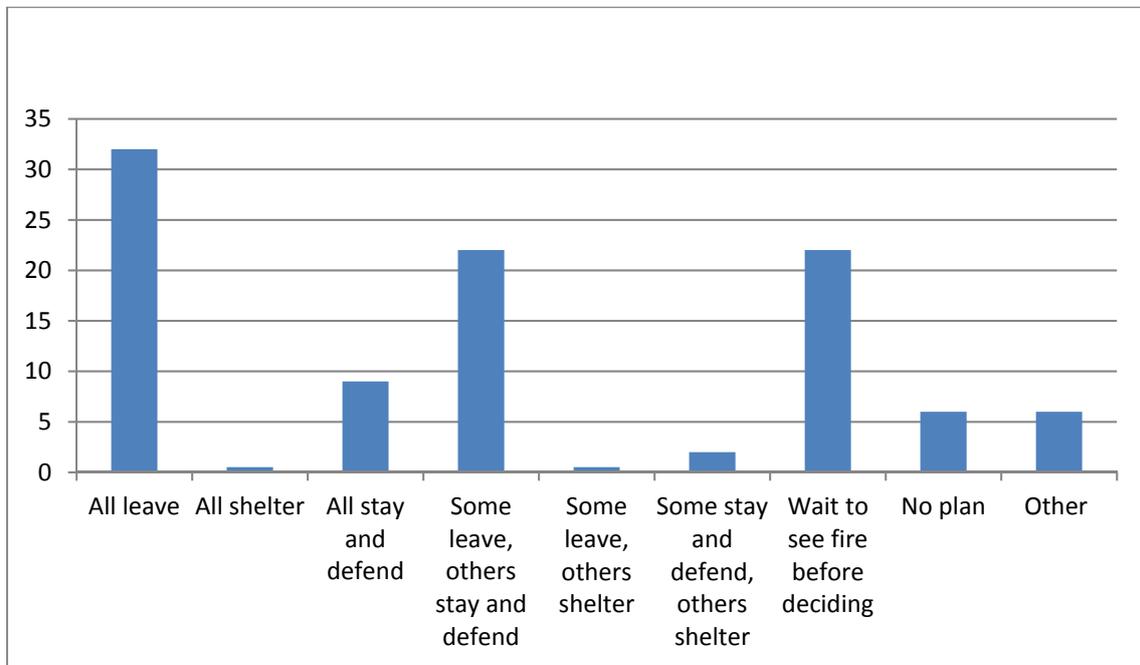


Figure 21: Household fire plan at the beginning of last summer

Figure 22 presents household fire plans at the beginning of last summer for the three main property types. It shows that respondents in houses or units on residential blocks more often had fire plans involving all household members leaving (41%, n=91) than those on hobby farms or small acreages (30%, n=58) and large farm properties (15%, n=13). Those on hobby farms or small acreages more often intended for all household members to stay and defend (12%, n=24) than those on residential blocks (5%, n=12) and large farm properties (8%, n=7). However, a greater proportion of respondents on large farm properties planned for some household members to leave while others stayed to defend (35%, n=30) than on hobby farms or small acreages (23%, n=44) and residential blocks (17%, n=37). A considerable proportion of respondents on each property type planned



to wait until there was a fire before deciding what to do (19%, n= 43 on residential blocks; 22%, n=43 on hobby farms/small acreages; and 28%, n=24 on large farm properties).

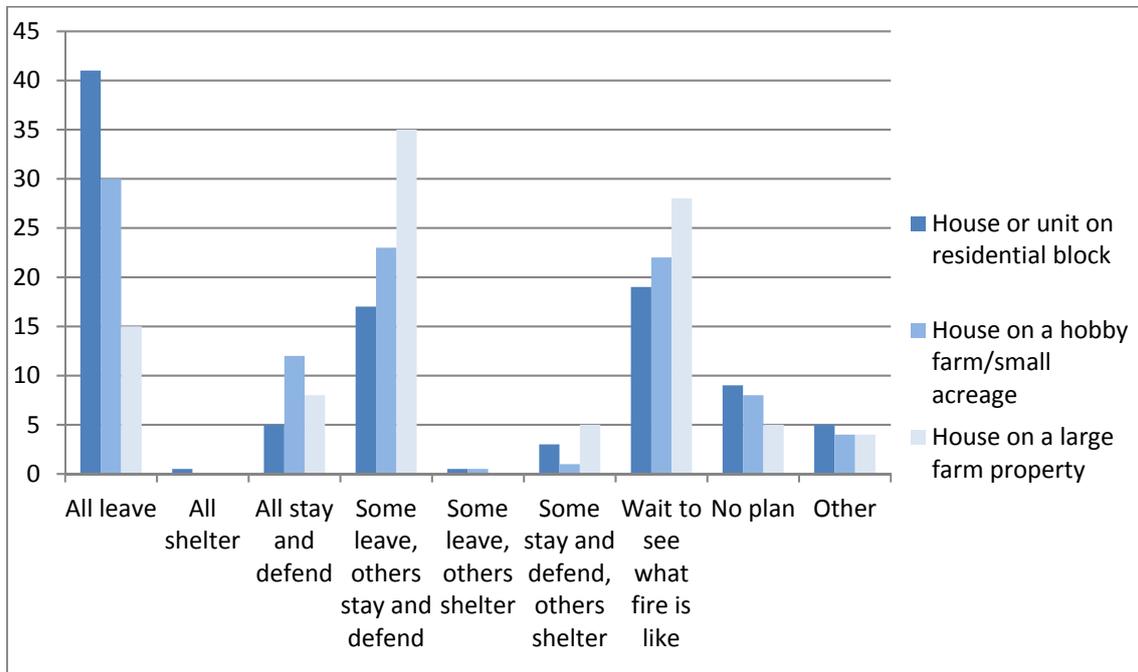


Figure 22: Household fire plan at the beginning of last summer, by property type (%)

As part of their planning, the vast majority of respondents discussed what they would do with other members of the household (90%, n=432) and considered what they would do with pets, animals and livestock (91%, n=400).⁵ More than two-thirds had considered how things could change if some household members were not at home (70%, n=332). One-third had developed a written plan or a list of things to do and remember (34%, n=165), and 17% (n=80) had practiced or rehearsed the plan. Two-thirds had identified a place to shelter as a back-up (66%, n=342). Respondents commonly identified houses, cleared areas on their property, dams or other water bodies, and public buildings and reserves as places that would provide safe refuge from a fire.

The most common actions taken to prepare for bushfire (see Table 6) involved clearing fuel around houses, including: clearing gutters of leaves (81%, n=402), removing vegetation close to the house (75%, n=372) and clearing leaves, twigs and long grass for a distance of 20-30 metres around the house (73%, n=364). Most respondents reported reducing fuel load in key areas of their property (73%, n= 365). Over two-thirds of respondents had a water supply independent of the mains that could be used for firefighting (68%, n=339), but fewer had a power supply independent of the mains (42%, n=206). Just over half had obtained and prepared firefighting equipment (52%, n=257) and domestic equipment such as a ladder, buckets and mops (53%, n=260). More than half (58%, n=287) had an emergency kit such as a torch, radio and medicines, but fewer had prepared a kit of protective clothing for each member of the household (38%, n=186).

⁵ Percentages exclude 'Not applicable' responses.



Around one-third had taken action to protect against ember attack, including installing seals or draft protectors around windows and doors (35%, n=169), covering gaps, underfloor spaces and vents (33%, n=162) and installing gutter guards or protection (27%, n=132). Less than 10 % of respondents had installed a sprinkler system on the roof to protect against bushfire (9%, n=43). One in five respondents had conducted hazard reduction burns (18%, n=88). Most of the 'other' preparations identified by respondents (n=25) fit within existing categories, such as reducing fuel. Some noted that they prepared a bag with documents and other valuable items to take in the event of a fire. Another noted that their house had been designed and constructed for a BAL 29 level, despite being assessed as being at BAL 12.5. A small number of comments identified reasons for not making preparations:

'Not allowed to do hazard reduction burns!'

'Local RFS were reluctant to assist with hazard reductions'

'Council would not let me clear back of house yard as too close to crown land. I did clear small bit but received a letter to sue us for 1.1 million for clearing shrubs'

'Unfortunately disabled and not physically active'

How can a single, aged person do all this? Just about to give up on this 'survey'.

Fortunately, this last respondent completed the survey and, in the box provided for any further comments about bushfires, offered the following comment:

Please consider single people who live on their own and cannot do the work required. Some of the questions make it sound like I don't care, but in actual fact I can't do it.



Table 6: Actions taken to prepare house and property

Action	Yes	No	Not applicable	Total			
Cleared leaves, twigs and long grass for a distance of about 20-30m around house	73.39%	364	19.56%	97	7.06%	35	496
Removed vegetation close to the house	74.70%	372	19.68%	98	5.62%	28	498
Moved combustible materials such as firewood and garden furniture away from the house	68.55%	340	20.77%	103	10.69%	53	496
Cleared gutters of leaves	80.56%	402	13.63%	68	5.81%	29	499
Installed gutter guards or protection	27.05%	132	66.80%	326	6.15%	30	488
Had a water supply independent of the mains such as a dam, water tank or swimming pool that can be used for firefighting	68.21%	339	25.15%	125	6.64%	33	497
Had a power supply independent of the mains (e.g. generator or solar cells)	41.70%	206	52.23%	258	6.07%	30	494
Covered gaps, underfloor spaces and vents to reduce the risk of embers entering the house or cavities (e.g. roof, wall etc.)	33.33%	162	54.73%	266	11.93%	58	486
Obtained and prepared firefighting equipment (e.g. hoses and a pump)	52.24%	257	39.84%	196	7.93%	39	492
Obtained and prepared domestic equipment such as ladder, buckets and mops	52.85%	260	41.46%	204	5.69%	28	492
Had a slip-on, tanker trailer or other mobile firefighting unit	27.35%	134	57.55%	282	15.10%	74	490
Installed seals and/or draft protectors around windows and doors	34.56%	169	59.30%	290	6.13%	30	489
Installed a sprinkler system on the roof	8.83%	43	83.57%	407	7.60%	37	487
Prepared a kit of protective clothing for each member of the household	37.96%	186	55.71%	273	6.33%	31	490
Prepared an emergency kit such as a torch, radio and medicines	57.98%	287	38.38%	190	3.64%	18	495
Prepared a safe area for pets, animals or livestock	49.60%	245	29.76%	147	20.65%	102	494
Reduced fuel load in key areas of my property	73.00%	365	16.40%	82	10.60%	53	500
Established and maintained fire breaks around my property and key assets	54.58%	268	28.72%	141	16.70%	82	491
Conducted hazard reduction burns	18.11%	88	60.08%	292	21.81%	106	486
Other (please specify)							25



The majority of respondents were fully insured for their home (91%, n=412), contents (86%, n=418) and vehicles (90%, n=432). Rates of underinsurance (partial) and noninsurance (none) were higher for farms (33%, n=55 and 14%, n=24, respectively) and businesses (22%, n=28 and 15%, n=19) (see Figure 23 and Table 10).

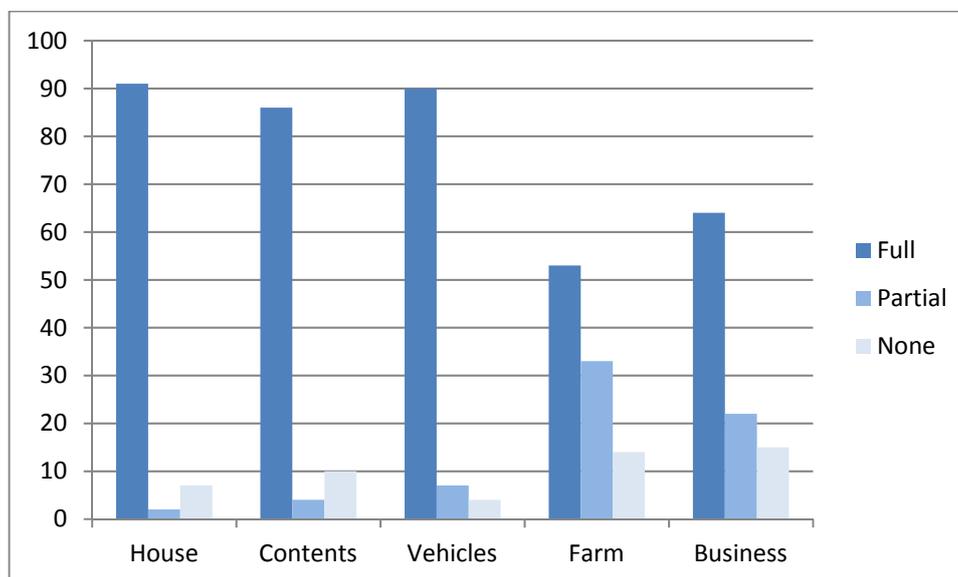


Figure 23: Insurance coverage at the beginning of the season (%)⁶

Table 7: Insurance coverage at beginning of fire season⁷

Asset	Fully	Partially	None	TOTAL
House	91% (n=412)	2% (n=9)	7% (n=30)	451
Contents	86% (n=418)	4% (n=20)	10% (n=46)	484
Vehicles	90% (n=432)	7% (n=32)	4% (n=17)	481
Farm	53% (n=89)	33% (n=55)	14% (n=24)	168
Business	64% (n=82)	22% (n=28)	15% (n=19)	129

Just under half of the survey respondents rated their level of preparedness for bushfire in 2017 as high (34%, n=169) or very high (12%, n=61) and a similar proportion rated their preparedness as average (42%, n=211). Relatively few respondents considered their preparedness level to be low (8%, n=41) or very low (4%, n=21) (see Figure 24).

⁶ Percentages exclude 'Not applicable' responses.

⁷ Percentages exclude 'Not applicable' responses.

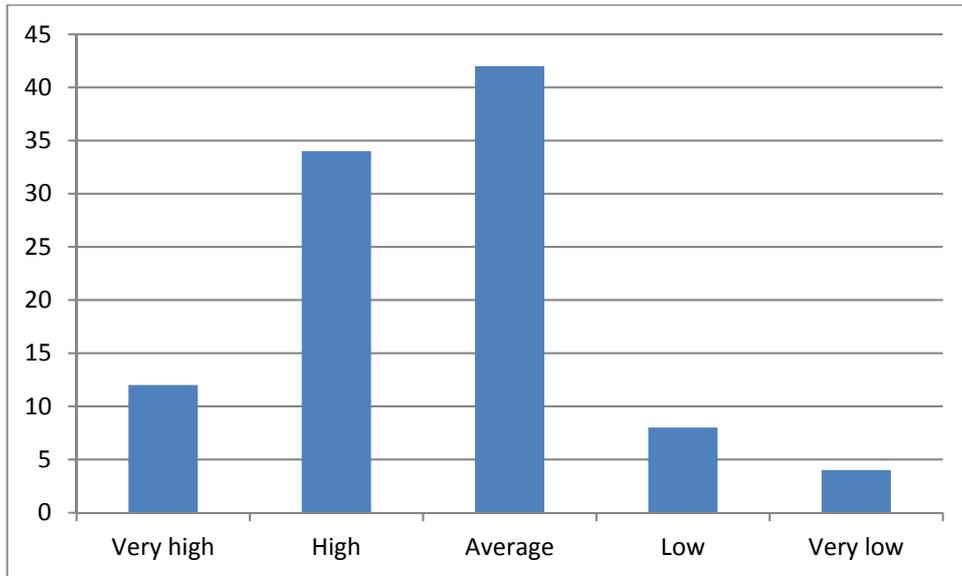


Figure 24: Perceptions of preparedness level (%)

Two in ten respondents (18%, n=90) believed they had done everything they could to prepare and four in ten (42%, n=210) considered themselves well prepared but felt there were a few other things they could have done. Three in ten (32%, n=160) believed they had made some preparations but there was a lot more they could have done and one in ten (9%, n=43) felt they had made little or no preparation (see Figure 25).

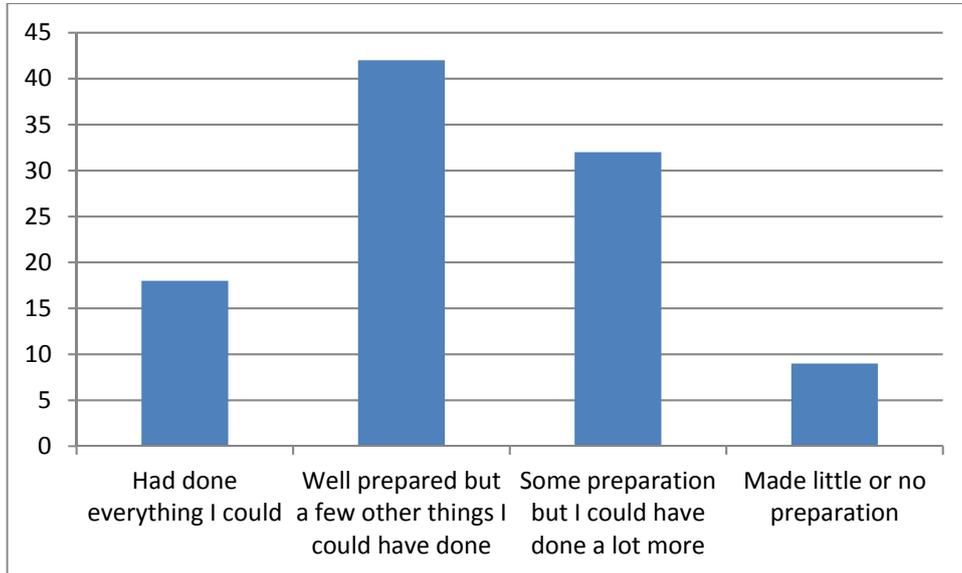


Figure 25: Feelings about preparedness level (%)

90 respondents commented on other things they could have done to prepare. While these varied considerably in detail, common responses included:

- Managing fuel, such as removing vegetation, clearing gutters and hazard reduction burning;
- Sealing gaps in roofs, underfloor spaces and around houses to protect against embers;



- Purchasing equipment such as generators, pumps, firefighting hoses, Personal Protective Equipment (PPE), water tanks, and sprinklers (roof and garden);
- Developing or improving plans, including practising or rehearsing the plan;
- Planning for the protection of pets, livestock and other animals; and
- Preparing emergency kits.

A small number of respondents commented on factors that prevented them from being more prepared including financial and time constraints, regulations and procedures related to vegetation clearing and hazard reduction burning, and inhabiting a rental property:

'Nothing. We do not have the finances or time'

'Financial constraints prevented installing gutter protection, sprinkler system and adequate gap sealing.'

'Cleaned old wood etc. from under house and some other general maintenance but it's a rental property and not able to.'

'Burnt more, but regulations and procedures around burning make it complicated for the average person to do.'

'Removed some trees close to buildings. But not allowed by local Council as land is classified SEP14'

'it was unlikely this place would be effected given the location and surrounds BUT if it did get impacted it would go up like a pile of twigs with 2 stroke on it... as a rental I could not do a lot of things I would like to.'

Protective responses

Of those who were threatened or impacted by bushfire in 2017, over a quarter left before (18.2%, n=42) or when the fire arrived (9.5%, n=22), and one-fifth (19.9%, n=46) were not at home or on their property for reasons other than the fire (see Figure 26). One quarter (24.2%, n=56) stayed to defend the house and/or property but the fire never arrived. 16 % (n=37) stayed and defended against the fire and 6.5 % (n=15) began defending and then left. A small proportion sheltered inside a house (3.9%, n=9), somewhere outside (1.3%, n=3) or in a vehicle or other structure (.4%, n=1). Based on these figures:

- 47.6 % of respondents left or were away from their house or property before/during the period of fire threat.
- 46.7 % of respondents stayed/returned to defend the house and/or property, although some were not impacted, and some attempted to defend then left.



- 5.6 % of respondents sheltered in a house, somewhere outside or in a vehicle or other structure.

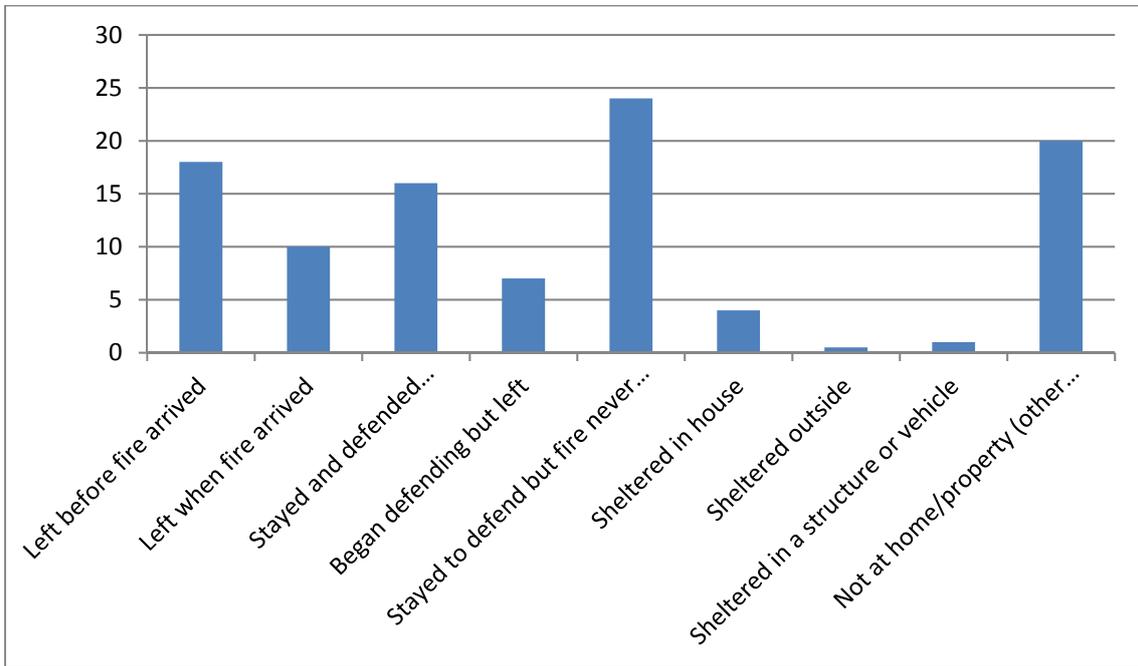


Figure 26: Respondents' response to the bushfire (%)

Those who left

Of those who left, almost half left their house or property (48%, n=31) because they felt it was too dangerous to stay (see Figure 27). One third left because they wanted to remove household members or visitors from danger (33%, n=21), because it was a day of high fire danger (33%, n=21) or because they saw or smelled smoke (31%, n=20). Around one quarter left in order to evacuate animals (25%, n=16), because they saw flames nearby (22%, n=14), because they received an official warning (22%, n=14) or because their plan was to leave when there is a fire (22%, n=14). 'Other' reasons for leaving identified by respondents (14%, n=9) included to remove children from danger, failure of firefighting equipment, and the effects of smoke on respiratory health.

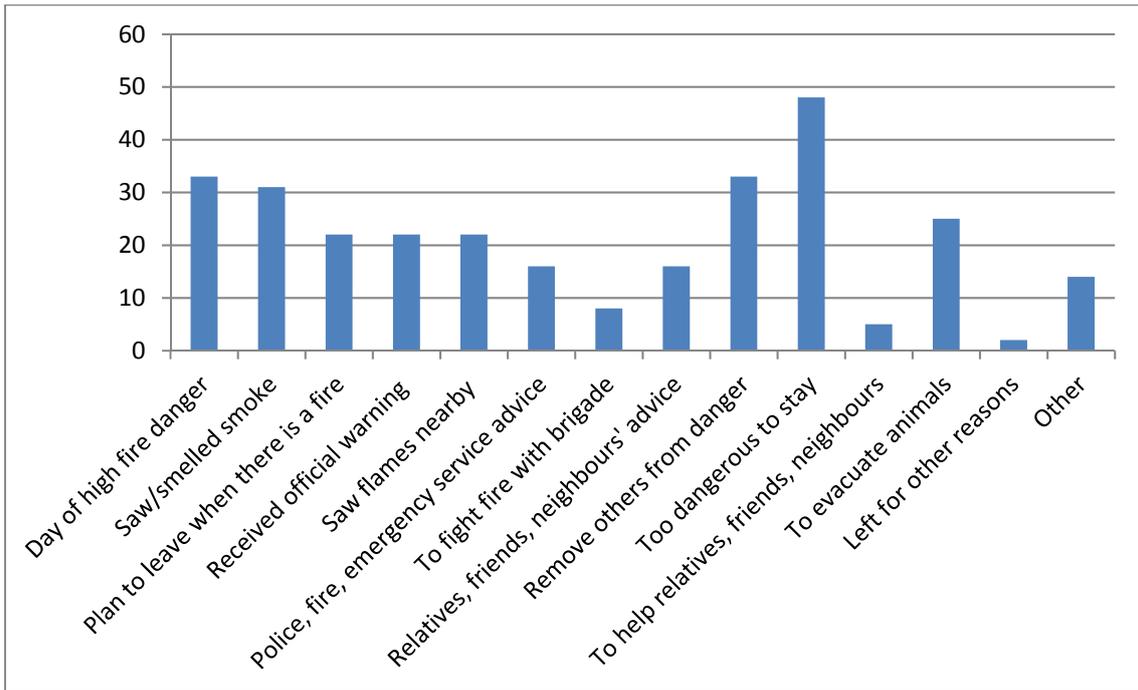


Figure 27: Reasons for leaving house or property (%)

Before the fire, most respondents had thought they would go to another house further away (40%, n=25), to a nearby town that was safe from a fire (35%, n=22) or to an evacuation centre (21%, n=13). Fewer planned to go to a house (16%, n=10) or building (14%, n=9) in their local area. Four respondents (6%) intended to go to a Neighbourhood Safer Place and five (8%) had not thought about it. Eight respondents (13%) identified 'Other' places they thought they might go, including a motel, equine evacuation centre and local fire station. As shown in Figure 28, the intended and actual destinations of those who left are largely consistent, although fewer people went to an evacuation centre of Neighbourhood Safer Place than was anticipated (see Figure 28).

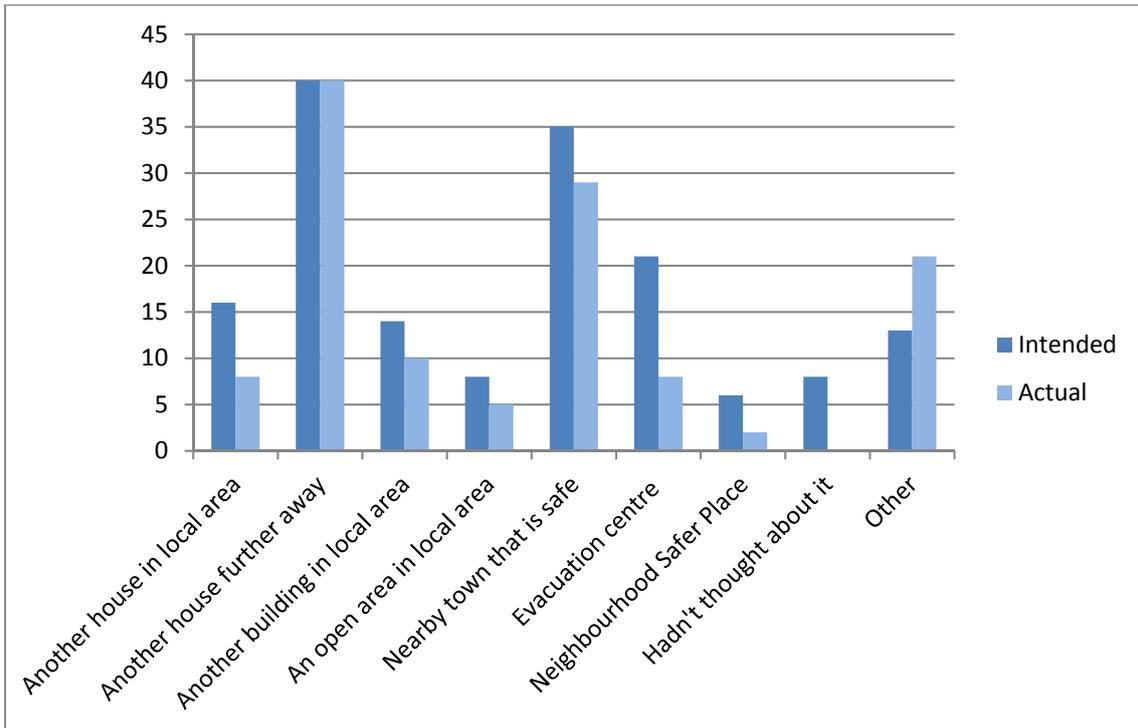


Figure 28: Intended and actual destination of those who left (%)

The majority of respondents who left felt the danger was very high (54%, n=34) or high (30%, n=19) when they left (see Figure 29). They most commonly reported experiencing difficulties associated with smoke (44%, n=27), embers (25%, n=15) and poor visibility (21%, n=13) when leaving. Some experienced difficulties associated with traffic (16%, n=10) and official road blocks (11%, n=7). However, despite most respondents feeling that the level of danger was high or very high when leaving, 46% (n=28) indicated that they didn't experience any of these difficulties (see Figure 30).

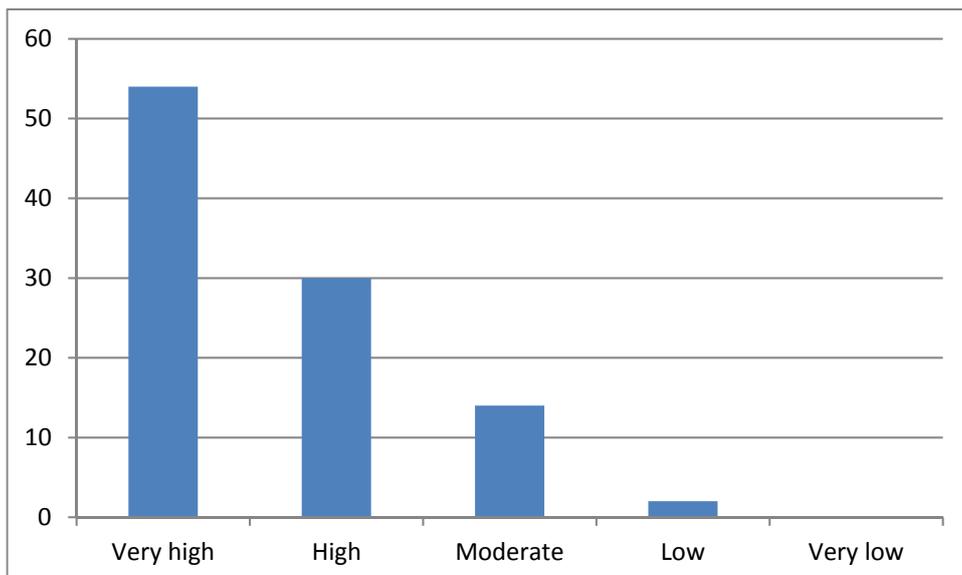


Figure 29: Perception of danger when leaving (%)

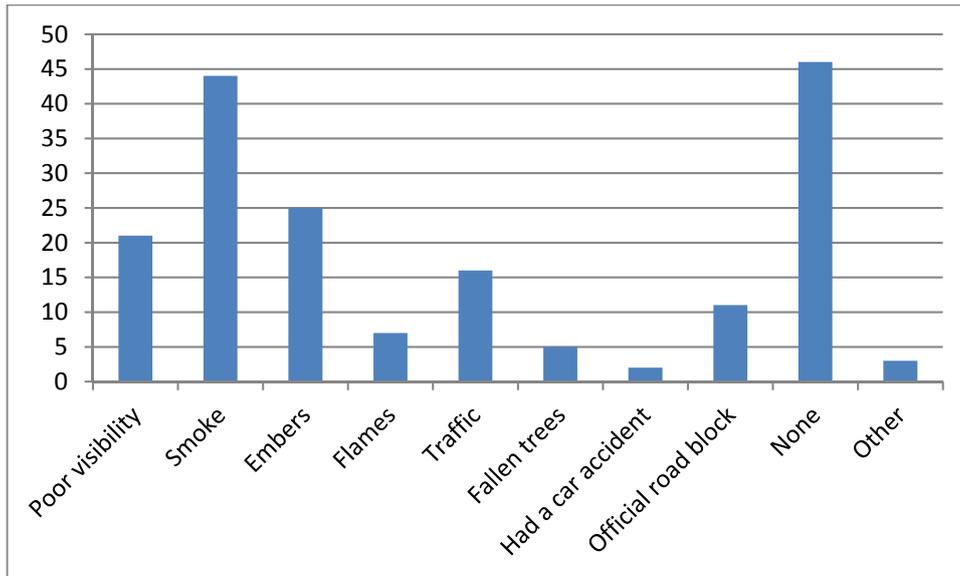


Figure 30: Difficulties experienced when leaving (%)

Most of those who left were away from their house or property for a few hours (40%, n=25) or overnight (30%, n=19). The main reasons people returned to their house or property was because the threat had passed (69%, n=42) and to see if their house or property survived (51%, n=31). One third returned to check on the safety of pets, animals and livestock (33%, n=20). Four in ten respondents reported encountering difficulties with roadblocks when returning (40%, n=24) and some encountered difficulties associated with smoke (28%, n=17) and fallen trees (18%, n=11). One third indicated that they did not experience any difficulties when returning to their house or property (32%, n=19) (see Figure 31).

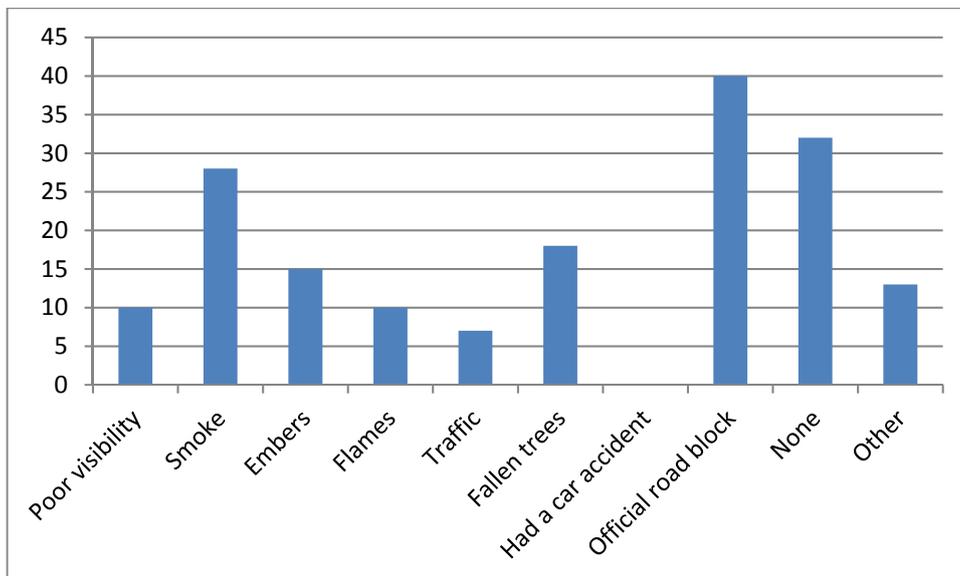


Figure 31: Difficulties experienced when returning (%)

The majority of respondents who left when threatened by bushfire indicated that they would take the same action if there was a similar fire in the future (87%, n=55). Twenty seven respondents commented on why they would or would not



leave in a future fire, with some noting they would leave earlier or later and others highlighting that protecting life is paramount:

'I would leave it a bit longer. Depending on fire warning.'

'Leave sooner. A wind change had the fire move swiftly in my direction.'

'I found I left last minute and couldn't think straight.'

'Safety of my children'.

'You can always build a new house. You can't bring back a life'.

Some noted that they would leave if Fire Danger conditions were 'Catastrophic':

'If it is a day of 48°C and high winds there is no point staying.'

'In the future before summer I would prepare my house, property and animals for fire to the best of my ability. However, I think it is beyond me to fight a fire on a catastrophic day so I would leave as soon as there was a fire in my area.'

'If it was a catastrophic day, power out & phone, definitely.'

Some respondents noted that whether they stayed or left would depend on the fire and/or other circumstances:

'Depending on the size of the fire we might stay.'

'If I am home alone I do not have the physical endurance to undertake sustained defending of my property without assistance. If all members of my household were home, then I feel that we could effectively undertake our stay and defend plan – but not alone.'

Those who stayed

The most common reason for staying with one's house or property was to protect it from the fire (63%, n=73) (see Figure 32). Similarly, many stayed to protect livestock or other animals (43%, n=50). Almost half stayed because the fire didn't reach their property and they felt it was not necessary to leave (46%, n=50). Only a small proportion stayed because they received an official warning advising them to stay (7%, n=8), they felt it was too late to leave (4%, n=5) or because they received advice from others to stay (4%, n=5). Some respondents identified other reasons they stayed at their home or property (15%, n=17) including:



'Disabled and had no way to evacuate when told to'

'My husband refused to leave and I wouldn't go without him'

'Access blocked by flames so had to stay until fire had reached dwelling area and road was clear of flames and it was then safe to leave'.

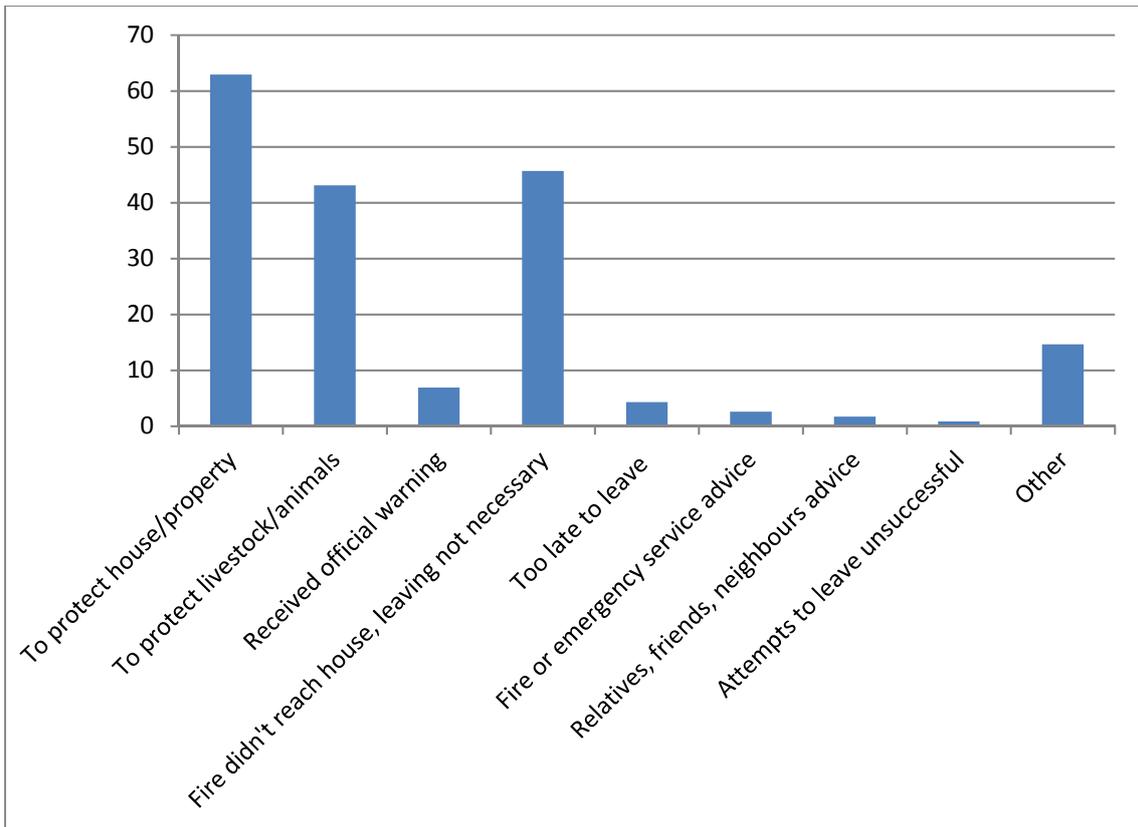


Figure 32: Reasons for staying with house or property

Respondents were asked how confident they felt while staying at their house and property (see Table 8). Results include:

- More than three quarters (79%, n=88) were confident or very confident that they could protect themselves and others from the fire.
- Two thirds were confident or very confident (66%, n=74) that they could protect their house from the fire.
- Half were confident or very confident that they could protect structures and assets from the fire (53%, n=59).
- Of those who had agricultural assets, less than half (47%, n=36) were confident or very confident that they could protect them from the fire. One third were not very confident (32%, n=25) and one fifth were not confident at all (21%, n=1666).
- Just under two thirds were confident or very confident they would get help from other people (64%, n=59).



- Under two thirds were confident or very confident they would get help from emergency services (61%, n=69).

Table 8: Confidence when staying at house or property

	Very confident	Confident	Not very confident	Not confident at all	Total
Protect self and others	35% (n=39)	44% (n=49)	14% (n=16)	7% (n=8)	115
Protect house	26% (n=29)	40% (n=45)	24% (n=27)	10% (n=11)	115
Protect structures and assets	16% (n=18)	37% (n=41)	32% (n=35)	15% (n=16)	115
Protect agricultural assets	13% (n=10)	34% (n=26)	32% (n=25)	21% (n=16)	77
Get help from other people	29% (n=32)	32% (n=35)	18% (n=20)	20% (n=22)	109
Get help from emergency services	25% (n=28)	36% (n=41)	28% (n=32)	11% (n=12)	113

19 % of respondents (n=22) felt their life was endangered while staying at their house or property, while the remainder (81%, n=94) did not. Seven of these respondents were threatened or impacted by the Sir Ivan fire (32%), four by the Pappinbarra fire (18%), three by the Carwoola (Taliesen Road) fire (14%), one by the Currandooley fire (5%) and six by other fires (27%).

In terms of the clothing and equipment worn by those who stayed, respondents most commonly indicated that they wore long sleeved shirts and pants (63%, n=65). Fewer wore a dust mask or cloth to cover the mouth and nose (36%, n=37), gloves (37%, n=38), goggles (20%, n=20) or a helmet (12%, n=12). The protective clothing people wore will have depended on the degree of exposure to fire, including smoke, radiant heat, embers and flames. In terms of water supply, half indicated that they could draw water from a pool, spa, dam or tank (48%, n=50) and 40% % said they had a mobile water supply (n=41). More than a third reported that they had a firefighting water pump (40%, n=42) and firefighting hoses and nozzles (37%, n=38). Garden hoses were more commonly used (58%, n=60) in addition to other domestic equipment such as garden tools (41%, n=43), ladders (38%, n=39), garden sprinklers (35%, n=36). Just six respondents reported using a bushfire sprinkler system (6%). Some respondents used tractors to protect their house and property (17%, n=15).

Most of those who stayed at their home or property during the fire engaged in preventative wetting down of objects (60%, n=67). Relatively few respondents needed to extinguish fires in vegetation (20%, n=22), extinguish embers on the house (13%, n=15) or outbuildings (10%, n=11) or had to protect the house from direct flame contact or radiant heat (13%, n=15). Other actions taken to protect the house (18%, n=19) included: 'Securing some things that were torn loose by the incredible hot wind'; 'After fire front had passed, went and defended our neighbours place as they had evacuated with animals'; 'Using bulldozer to



increase firebreaks around livestock'; and 'Removed shade cloth on structures around house, hosed down house'.

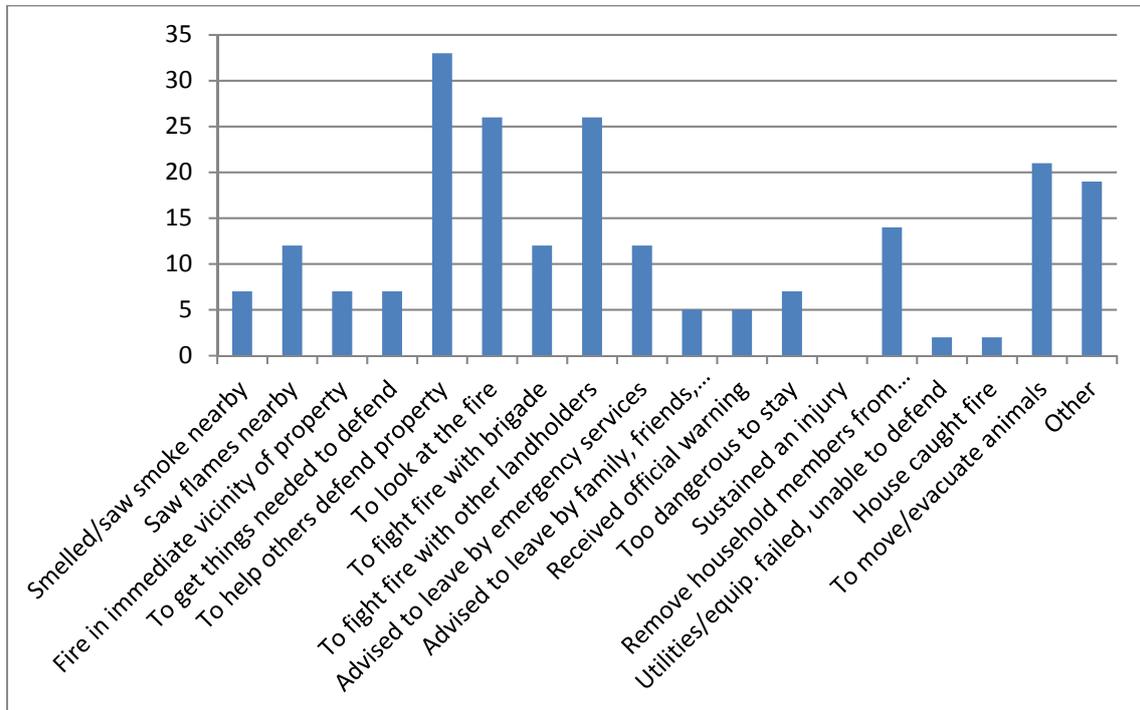


Figure 33: Reasons those who stayed left (%)

More than two-thirds of survey respondents reported that they left their house or property during the fire (38%, n=44) (see Figure 33). The main reasons for leaving during the fire were: to help others defend property (33%, n=14); to go and fight the fire with other landholders or neighbours (26%, n=11) and to go and look at the fire (26%, n=11). They often went to another house in their local area (35%, n=13) or a house further away (19%, n=7). Four in ten went to other locations (44%, n=16), most commonly as NSW RFS members to fight the fire. Almost half (48%, n=20) felt the danger was high or very high when they left. Over a quarter felt the danger was moderate (29%, n=12) and the remainder perceived the danger low or very low (24%, n=10). They most commonly reported experiencing difficulties associated with smoke (42%, n=17), poor visibility (24%, n=10) and official road blocks (24%, n=10) when leaving. Some experienced difficulties associated with embers (20%, n=8) and flames (17%, n=7). 42% (n=17) indicated that they didn't experience any of these difficulties. Most were away from their property for less than an hour (23%, n=9) to a few hours (51%, n=20). The main reasons for returning were that the threat had passed (44%, n=18), to check on the safety of pets, animals and livestock (37%, n=15), to protect the house and property from the fire (34%, n=14) and to see if the house and property survived (22%, n=9).

The majority of respondents who stayed at their house or property during the bushfire indicated that they would take the same action if there was a similar fire in the future (90%, n=101). Forty five respondents commented on why they would stay in a future fire, with most comments focusing on the need to be there to protect the house and property, as well as the dangers of late evacuation:



'Learnt a lot of lessons and feel I can make my home safe rather than try and flee down a road that only has one exit'

'To defend it - most people die on the roads evacuating!'

'As long as I assessed conditions as safe to do so. A going fire under catastrophic conditions threatening to impact would be a totally different kettle of fish.'

'It's probably safer than being in a car travelling, especially since we have plenty of equipment for defence and someone from the local brigade considered it defensible.'

'Had we not been there we believed it is likely it would have burned down.'

'No choice in a rural setting. No one would fight for what I think is valuable, so better stay and defend my own property.'

4.8 PERCEPTIONS OF RISK TO AND VALUE OF AGRICULTURAL ASSETS VS. HOMES

Interviews with agricultural landholders in the Currandooley, Carwoola and Sir Ivan fires provided numerous insights into how they perceive risk to and value agricultural assets. After bushfires in rural areas, it is often said that agricultural landholders would have preferred fire services to protect agricultural assets rather than houses. However, other than often anecdotes, there is little documented evidence of this in the research literature. The view that firefighters prioritised houses over assets was certainly expressed by some interviewees.

'I think we would have been happier if the priority of fighting the fires would have been more on saving stock and paddocks instead of houses, because you can sort of live in a caravan if you have to, for a little while, but if your whole income burns to the ground, that's a bit harder I think.'

- Dunedoo

Interviewer: In terms of value, how important is the stock to you?

Male: Oh, it's high. Yeah, it's high. Look, I'd want them saved before the house realistically.

- Leadville



However, while there may be more financially valuable assets, interviews revealed that many agricultural landholders do prioritise protection of houses. As the following interview excerpts illustrate, homes often have utility values and sentimental or emotional values that exceed their direct financial worth. One farmer explained how the houses on his large farm property provided accommodation for his workers, without which he would be unable to rebuild the business:

The infrastructure is the thing too. Someone said to me the other day, "You got insurance on the houses." Well it's actually not about that. To rebuild five houses, how long is that going to take? Where do my staff live in the meantime? All those things. They're the stuff you've got to look after so that they can help me rebuild the business again.

- Carwoola

Others clearly prioritised the non-monetary values of their homes over more financially valuable assets. Asked if the house was his most valuable asset, a Leadville farmer replied:

It is and it isn't. So really, we'd be able to rebuild it... But it'd be just a headache to have to get on, build another house, and refurnish it. And there's things that you'd lose that you wouldn't be able to replace. Things that just had a value to you, and no real monetary value.

- Leadville

Another Leadville farmer also prioritised protection of his house over more valuable but easily replaced assets:

What assets are the most important? Probably our house. All the others can be replaced. They've just got machinery and that in it... I'm nearly 62, so we've been there, not in that particular house all my life, but here for most of my life. So you've got all your personal stuff and that, which is, you can't replace any of that stuff. I know I've got memories and photos and all that sort of stuff and little things about the house, and that's ... I think your home's your most important. Everything else is replaceable. You know? Fodder, hay, vehicles, all of that. You can go and buy them ... anyway. I know you probably can't afford it at the time, but if you've got it insured, that's why you have insurance, they can be replaced. It's got to be your house.

- Leadville



When asked if his priority was the house or agricultural assets, one Dunedoo farmer replied that his priority was the safety of the firefighters and visitors who were helping to protect his property:

We had three units around the house. One of the units was out here trying to put it out over here, and I realised my role had to change at that point. I was on the firefighting trailer that my son had made, this big impressive firefighting trailer, and we were putting out the yards and these pumps and different things. I thought, okay, I need to take a management role here, and my number one priority was the safety of people. There were a dozen people, including the three dozer drivers and the three units... I found myself just going between the units... making sure that they weren't all going to run out of water at the same time, making sure they were being effectual with their water use and time, checking safety equipment, thinking ahead. I was checking the ceiling, underneath the house.

- Dunedoo

Similarly, a grazier at Leadville explained that while he would do everything he could to save his livestock, he would never expect someone to endanger their life to do so:

Livestock? Well, I suppose they are what make my living, it is. So they've got to be pretty high on the agenda. But, compared with people, they're animals, I suppose. They're also replaceable... You do everything to try and save them. It's not like you'd leave them in a paddock and let them burn if you had a chance to get them out of there, but, you wouldn't put your life, your son's life or your other people's lives at risk to try and get a mob of sheep out of the paddock. You just wouldn't do that. If somebody got killed trying to save my sheep, I'd feel pretty horrible.

- Leadville

Some agricultural landholders had developed detailed plans that identified assets and how they would be prioritised and protected in a bushfire. In Carwoola, for instance, an interviewee described the fire plan for his large farm property.



We've got a schedule, if you like, of the most important items to protect: homes that have got residents in them; obviously the homestead and shearing shed because of their historic value; these outlying buildings. Then there are the low priority buildings where people aren't living or they're rundown buildings, or low value. All of those things are encompassed in our fire plan...'

- Carwoola

Others did not appear to have such sophisticated plans, but knew what assets they would try to protect first. The first thing many agricultural landholders affected by the Sir Ivan fire did was move livestock to safe areas:

Come Sunday, when it was ominous, we thought we were a big possibility of the fire coming up the valley. We started to move all the cattle and put them on the sanctuary block.

- Cassilis

Basically I had cattle up on hill, where there was three, four foot high cured saffron thistle and nowhere to go. So if the fire had come through that there, they would be barbecued. I would have lost a couple hundred thousand dollars' worth of stock. Yes, so I got them off the hill, brought them down where there wasn't much to burn. Which was a couple k's away it - was another block that I have got.

- Coolah

Male: Saturday night I did get them to shift some stock and get them a bit closer, on a bit safer ground.

Interviewer: Yeah, and how much stock have you got?

Male: We'd have five, six, seven thousand sheep. A hundred, a couple of hundred cattle... It's a big loss if you lose your stock. That's where we make our money.

- Leadville

Many agricultural landholders did what they could do to prepare their large properties, such as ploughing fire breaks and moving livestock, then fell back to protect what was manageable – often the house and any nearby paddocks or infrastructure. This was based on an assessment of what was possible with available time and resources, not necessarily what was of greatest value. The following interview excerpts highlight the challenges of defending large properties with valuable and widely distributed assets:



Because of how quick that fire was, you look at other fires that have burned that amount of land; most of the time you have a lot more time to cover that amount of country. But, that fire burnt so much country in such quick time... I'm not sure you can do anything effectively with 2,500 to 3,000 heads [of livestock] spread over 7,000 acres. It's not really my call to say how it would be done, because it would be a discussion, I suppose the managers and the owners would... [decide] which animals are more valuable, or how they pick what to do. Or, whether they target the paddocks that have got the most amount of fuel in them and move them [livestock] to a bare paddock or something. I don't know. That's probably not a question for me, it's more for the guys that run it. It would be difficult because of how quick that fire burned.

- Coolah

I was trying to put a break in down the hill... and realised... a fire break is just not going to help on a day like this. I came back, and I started coordinating things here. I go and get the pump in the pool and have the fence removed so the dozer can do this. I was just flat out watering things, running pumps, cleaning gutters. Yeah, all the preparedness that you would know. That mid-morning, I went up to the dozer working up there and said "Look, mate, I think we're wasting our time here." He said, "Look, we've been talking the same thing, let's get down to your house and clear it up," so he came down.

- Dunedoo

Many agricultural landholders also discussed their prioritisation of insurance. As discussed in Section 4.7, many agricultural landholders were significantly underinsured or uninsured for some assets. While most had full home and contents insurance, many could not afford to fully insure livestock, fences and other assets:

'It's prohibitive to insure everything... It would be nice to say we'll insure every building and every bit of machinery, every head of stock and all your fencing. But you'd spend your life to pay your insurance policy. You got to work out what you can save, what you can insure and what you can't... You can insure fencing but again it's very expensive. The big stations, I think they had some fencing insurance. They insure a certain percentage because they're exposed. They figure they're a big target... I think for smaller holdings, like us, no it's not viable.'

- Cassilis

[Insurance is] very dear I would say with fences, basically I never insure



them. I have inquired a few times but when you look at the price you think "well if I have dodged the bullet for two years, I've saved that much anyway." It is that ridiculously priced, I just cannot afford it I don't have a real big enterprise so we don't generate that much money to afford that unfortunately. I did have insurance but it is a necessary evil and I have all my vehicles and everything insured, home and contents and sheds and whatever.

- Coolah

We have some stock insurance. But, just trying to save money, we've taken the fencing insurance off – about three years ago... You don't think you're going to get a fire that will totally burn you out, I spose... So I cut back on insurance and then you go, 'Oh, take that off, take that off'... make it a bit cheaper.

- Cassilis

Overall, interview data demonstrate considerable variability in how agricultural landholders value and prioritise the protection of agricultural assets relative to homes. Some landholders do prioritise protection of livelihood assets due to their greater financial worth, while others prioritise protection of houses due to personal or sentimental values. Interviews with agricultural landholders highlighted how, during an actual bushfire emergency, people will assess what they can protect with the time and resources they have at their disposal. As one interviewee explained:

The quicker we put every little bit out, the better my livelihood going forward as a business is. It's not really prioritising what we save; it's just trying to save as much as we can.

- Carwoola

4.9 INFLUENCES OF PREVIOUS FIRE HISTORY AND EXPERIENCE ON PLANNING, PREPAREDNESS AND DECISIONS

Online survey

More than two-thirds of respondents indicated that they had some experience with bushfire at the beginning of last summer. Most commonly, they had been a volunteer firefighter (33%, n=136) and/or had defended their house or property against bushfire (23%, n=126). Almost one-fifth of respondents had experience using fire as a tool for managing land on their property (19%, n=103) and/or had left early or evacuated due to bushfire (19%, n=103). Smaller proportions of respondents (>10%) reported having houses or property damaged by previous bushfires (see Figure 34).

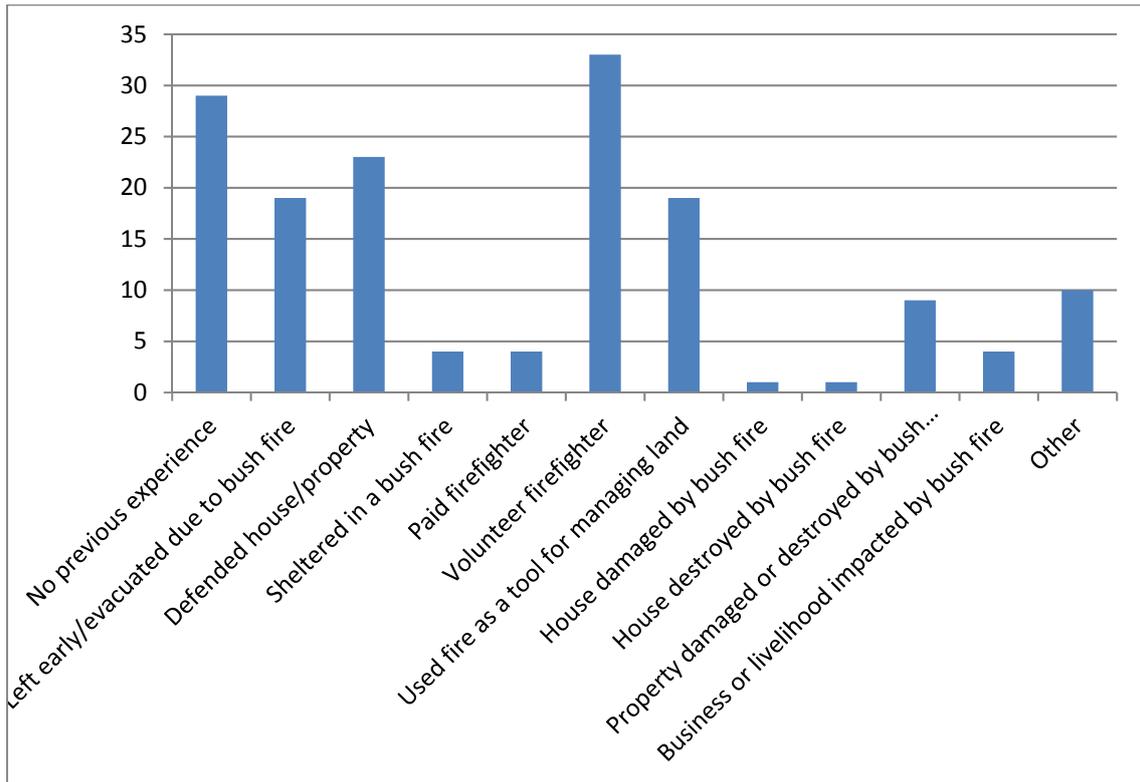


Figure 34: Previous experience with bushfire (%)

Table 9 presents measures of planning and preparedness for the five most common types of bushfire experience among survey respondents: volunteer firefighting; leaving early or evacuating; defending a house or property; using fire as a tool for managing land; and no previous experience. On the whole, those with experience of bushfire were more likely to have read the NSW Guide to Making a Bushfire Survival Plan than those with no experience (approx. 75% v. 62%). Fewer respondents with no prior experience, although still a clear majority, had discussed what to do with other household members or considered how things might change if others were not home. Proportions of respondents having developed written plans were relatively low across the five experience groups, suggesting that this is not a good indicator of planning or preparedness. The proportion of those rating their preparedness as 'high' or 'very high' was considerably lower for those with no prior experience; however, these assessments are subjective and are not tied to 'real' measures of preparedness. Nevertheless, these results suggest that there may be a link between experience, such as volunteering as a firefighter, and greater planning and preparedness.



Table 9: Measures of planning and preparedness (%), by fire experience

	Read NSW Guide to Making a Bushfire Survival Plan	Discussed what to do with other household members	Considered how things could change if some household members not home	Developed a written plan	Rated preparedness as 'high' or 'very high'
Volunteer firefighter	76% (n=133)	90% (n=144)	77% (n=122)	41% (n=65)	67% (n=111)
Left early or evacuated	77% (n=79)	94% (n=90)	69% (n=64)	38% (n=36)	40% (n=39)
Defended house or property	81% (n=94)	94% (n=107)	77% (n=86)	38% (n=43)	60% (n=71)
Used fire as a tool for managing land	70% (n=72)	92% (n=86)	71% (n=68)	34% (n=33)	61% (n=60)
No experience	62% (n=96)	80% (n=105)	59% (n=75)	29% (n=39)	24% (n=34)

Interviews

As discussed in Section 4.6, experience with smaller, less destructive bushfires meant that some people did not anticipate that a fire of the size and severity of Sir Ivan could happen in their area. Some interviewees noted that they had prepared based on an expectation of a 'normal' bushfire, and questioned whether it was even possible to prepare for a fire like Sir Ivan:

I mean, the normal bushfires, localised sort of thing. You know you're ready for that. But what happened over there, I don't think anybody was...

- Coolah

It's my fault I probably ignored them [warnings]. It didn't look like it was that much off, and living up here you see smoke and a bit of bloody fire, but it never goes like this.

- Uarbry

Again, what level of preparedness do you prepare for a fire like that every year? Can you even maintain that level of preparedness? I mean you can't plough out the paddock in front of the house every year. For land management, it's just silly to do that.

- Coolah



When you look at it, which we've all done I think since the fire, there's not a lot you can change to protect yourself from something like that. Firestorms are firestorms.

- Cassilis

Interviewees affected by the Carwoola fire often referred to a bushfire that occurred in the area in 1985. Memory of this fire was strong among longer-term members of the community and had been passed on to some newer members of the community and appears to have influenced their awareness of bushfire as a local risk:

The '85 fire and the 2017 fire... followed exactly the same path, to the point where one of the houses that was lost over the Widgiewa Ridge, the owner was telling me that the fellow from whom he bought it told him that in '85 he had all his building materials stacked on site and he lost them to the bushfire. That's twice that same property has been burnt out. In the same street as [name removed] who we were talking about, there's a couple who defended their house in '85 and they defended it again in 2017. Same direction of fire. The whole nine yards.

- Carwoola

We've been here 21 years, and this is the only incident literally that's ever come close to us. And we know that the last major fire that hit this area was in 1985, so I guess you're playing the odds a bit too saying it's not like it's, say, parts of western Victoria where you've got to be a bit real about the fact that it's going to hit every few years. This year was really quite exceptional, so you are looking at a bit of a risk view of it as well.

- Carwoola

Some interviewees affected by the Carwoola and Currandooley fires referred to the 2003 Canberra bushfires. Memory of this fire influenced people's awareness and, in some cases, prompted people to develop fire plans:

Interviewer: You've got a very detailed plan, and you've obviously got equipment, and you rehearse your plan; very fire aware. Is there something that motivated this?



Female: The 2003 fires motivated me to do the fire plan... I realised on the day of the 2003 fires that it actually takes a long time to clear up things that have accumulated, so during the fire season it is a good idea to keep that sort of thing down so you can start straight away with the more important things.

- Carwoola

When the 2003 fires were around Canberra... I was up on the roof that afternoon because we were getting ember attacks and burnt leaves hitting the roofs and hitting the guttering, and you could just see, and this stuff was still hot, so you could see that even though it's miles away, it can jump well ahead of the fire front....

- Carwoola

We did the same thing when the Canberra bushfires were happening. My daughter was living here at the time, and I remember her being worried about all of her documents... She said, "Mum, I'm going to put all of these in the Ute," because we could hear what's going on in Canberra, but no one was telling us where it was out here. And embers were dropping, we could see red glow on the horizon. We didn't know where it was going once it got passed Canberra. So, at that stage she packed her Ute and I said, "I think I might do the same." So, whenever that was ... 2003? So, for me, that was like a practise run. I knew what I wanted to put in there.

- Carwoola

Some interviewees referred to their knowledge of the 2009 Black Saturday bushfires in Victoria as a factor influencing their planning and preparedness. The devastating nature of these fires, which killed 173 people and destroyed over 2000 houses, seems to have encouraged them to think about 'worst case' scenarios:

They'd been talking about it for two days that it was going to be the worst day in history up here. Which took us back [reminded us of] to Black Saturday, because we were always talking about Black Saturday down in Victoria. We knew it was coming and going to be bad. They don't usually say it's catastrophic for nothing... We were kind of getting prepared half a week out, because it was going to be a bad day.

- Cassilis

My understanding of bushfires are the Black Saturday bushfires, so that's what I've always expected if it comes, that's the level of what



we're gonna have. So, my plan previously had been just leave, and then through research I realised that, that wasn't a complete plan, 'cause there was heaps missing from that plan. So, then I did a, "If I am at home, what plan do I have now?"

- Carwoola

Fire breaks, excellent things. Love them, don't necessarily believe it's going to stop it. Not anymore. I've seen... Well, 2009 some of the Victorian fires, they jumped the Hume. They didn't jump just one double laner, they jumped two double laners and kept on going.

- Mount Fairy

An interviewee at Carwoola installed sprinklers on his roof after seeing a photograph of a house that survived an intense fire during the 2009 Black Saturday fires at Kinglake:

I saw a photograph of a house at King Lake. It was a two-story timber house surrounded by burnt out mountain ash. At the front of the house was the burnt out four wheel drive and its melted alloy wheels, but the house was intact. Because it had this spray system on it, which we've tried to replicate here. It's the same fire system they have on warships. It envelops the whole building in a mist and the wind- fire produces its own wind. And the wind blows that mist into the same places that it would blow embers. The real threat here is ember attack... That's what the spray system's all about. The house won't survive without that spray system. Quite convinced of that.

- Carwoola

Others cited their experience as NSW RFS members as factors influencing their planning and preparedness. Although some of these people were no longer active members, the knowledge and experience they had gained through training and attending fires had been beneficial:

Male: We've both done training in the bushfire brigade.

Female: Even though I can't volunteer anymore. But I did the basic training anyway so I would learn about fire behaviour.

Male: I've fought fires... I've helped with quite a few grass fires in the local area... I had to go up to the Tallangada State Forest... We did a back burn onto the fire front there...

- Carwoola



Yeah, I think that experience of being in the brigade has been invaluable. So that's probably why some of the landscaping is the way it is.

- Carwoola

My first big fire was the Victorian fires of 2009. I did 3 tours down there and I've been to Brooms Head to fires, Narrabri... Went down to Penrith in October 2013. The Wambelong fire, the Oxley fire at Coonabarabran. One of the fires at Binnaway, couple of big ones around the Dunedoo area. Anytime there's a call for our area crews I'm normally on it, which is where I've learnt most of my firefighting skills. I've been doing this for 17 years now and it's just sad, the lack of knowledge, or when you try to explain to someone that you need to tidy this up because this could happen, when you're doing community engagement... 'Oh it happened here 30 years ago, it's not going to happen again'.

- Leadville

In Carwoola, an interviewee explained how he had been involved as a NSW RFS member in an exercise with the CSIRO at Braidwood. Through his participation in the exercise, he gained knowledge about radiant heat that led to changes in the way he prepared his own property:

I was involved in an exercise we did with CSIRO at Braidwood a bit over a year ago, where they conducted grass fire burning exercises on predefined plots that were cured at different levels. Some was that they'd used a weed killer to kill all of the vegetation, others are just naturally cured. We did these burning exercises on a total fire ban day, where the air temperature was about 34 degrees. The wind was gusting up to about 30 kilometres an hour. I was on a truck where we were charged with stopping the fire from spreading past this predefined lot, which wasn't all that big, and they have a series of them. But the one thing that it taught me too was that even though we had the wind behind us at one stage, the intensity of the radiant heat from the grass fire was such that I had to put a visor down because it was so hot on my face. Yet we would have been 10 metres away from the fire, and it was advancing away from us, and we were chasing it with the truck, but the radiant was just astounding. It taught me, vividly, that the height of the grass has a significant bearing on the intensity of the fire and the heat. My intention is to keep the grass down to very low levels, all of the time. That's one thing I'll do.

- Carwoola



4.10 IDENTIFIED INTERVENTION STRATEGIES

As noted above, many survey respondents actively sought information from the NSW RFS about planning and preparedness and information relating to specific fires. Most survey respondents reported that they had read the NSW RFS Guide to Making a Bushfire Survival Plan (71%, n=384) and many had used it as a basis for household discussions about what to do in a bushfire. Similarly, many had accessed information via Fires Near Me, which was commonly identified as the most useful information source. Social media was another information source accessed by respondents, in particular local NSW RFS Facebook pages.

In addition to information sources such as these, some interviewees provided insights into community engagement initiatives that were happening in their areas. For example, a member of the Rossi fire brigade, who responded to the Carwoola fire, discussed how the community events they participated in provided opportunities, in addition to raising funds, to recruit new members and promote fire awareness within their community.

That's the importance, I think, of community engagement. Because we go out and we do barbecues and open days. That's going to continue as a feature next year... We're doing the barbecue so, as a result, I think within the community we have a pretty high profile and that in itself then encourages people to think about volunteering, and we've been successful in getting some of the younger ones.

- Rossi

A member of the Stoney Creek fire brigade at Carwoola explained that community engagement had been limited before the 2017 fire. However, the brigade capitalised on renewed interest and engagement after the fire and was running whole-day community preparedness workshops:

To be honest, I wouldn't have thought it was any better prepared than anywhere else. Yes, we've put in a lot of work to engage with the community but at the time before the fire the engagement response was small. You provide opportunities to your local residents, but not many people turn up. Some do, but not many. That changed very smartly after the fire and we got very significant community engagement, and that's been part of what we've been involved in. So a lot of community preparedness workshops. I've come up with a whole day workshop, and prepared all the material for it. I've delivered one, and I'm going to deliver a second workshop soon. That one is fully subscribed. I've got another full workshop ready to go, and we'll keep offering that as long as people keep wanting them... What I'm trying to get at with these community preparedness workshops is to think about those issues. Is it safe to come back in? I'm trying to get them to think about all the different eventualities... What happens if you are at work? What happens if your young child is at home and you're at work? What are you going to do about that? How prepared



are they? How prepared are you to defend your house if you can't get out? If you intend to leave, but you can't, maybe you need to be prepared to do some defending anyway just to save your life, because you shouldn't be evacuating down a single evacuation route. Maybe you need to think about those things, be prepared to for them even though you're not intending to.

- Carwoola

After the fire, the Stoney Creek Brigade's Community Engagement Officer requested assistance from the NSW RFS Hotspots team. A high degree of interest from the Carwoola community led to four Hotspots workshops being held in September and October 2017. The Stoney Creek brigade, with the support of the NSW RFS Hotspots team and Lake George District, now runs a monthly Hotspots café event 'as a mechanism to engage the community'

A farmer at Mount Fairy discussed the visits he had from NSW RFS community engagement. These meetings provided opportunities to discuss ways to prepare the property, as well as specific risks, such as the long, narrow and densely wooded entrance.

Male: There's a local lady from the RFS who comes out and does do talks with us... about preparedness for fires, like gutters, making sure there's no sticks laying around, making sure your equipment's right, if you've got the equipment, access, UHF's. On the desk there, there's a card with all the GPS points of the farms...

Interviewer: In terms of the RFS person who comes out to talk to you, do they have any advice about the agricultural side of this property, or more the houses?

Male: More the houses, but they have, we probably put ideas forward to them more than them bringing them to us, and that's not necessarily wrong or right, that's just how it is.

Interviewer: What sort of things are they?

Male: The strip grazing areas around, growing more green trees, stuff like that... They've advised us that this road is a potentially, a preventative from getting trucks in here. We need to look at alternatives for that. There is another road that goes out over there, but it's not a great road. They gotta cross the creek. If the creek's up, you probably wouldn't get a fire truck across it.

- Mount Fairy



In Dunedoo, a member of the local fire brigade discussed the challenges of engaging people in bushfire safety initiatives. He recounted some successes with young people through the NSW RFS Secondary School cadets programs, including one where a young girl used the knowledge she had gained to extinguish a small fire in her family home. However, he expressed frustration at limited community engagement with NSW RFS preparedness programs and advice:

With doing community engagement, you don't count your losses you count your wins. If you go to a show and you get someone coming up asking you how to set up a static water supply with their house and what fittings you need and what would you do, sort of thing, you give them the advice and you give them the bushfire survival plan and we'd say to them, righto, instead of reading the whole lot of it go to page 16 and 17... [Decide] whether you're going to leave early or stay and defend. Read those two pages first. Alright. And if you going to stay and defend you read the stuff that's got to do with that, or if you're going to leave, read the stuff to do with that. And if you've got horses or animals you read the part about that. Instead of saying here read this all. Because it's about that thick [gestures]. And over about the six or seven years I was doing the shows, the best uptake I had on that was some people from the grey army, you know, towing the caravan around.

- Dunedoo

4.11 PUBLIC EXPECTATIONS OF FIRE AND EMERGENCY SERVICES

Interviews with residents affected by the Currandooley, Carwoola and Sir Ivan bushfires provided important insights into public expectations of fire and emergency services. This information was not intentionally sought but emerged due to the semi-structured nature of the interviews, which allowed interviewees to tell their personal stories (see Section 3.1). In Carwoola and Currandooley, expectations of fire services were largely met. Most people did not expect to receive personal firefighting support. In Carwoola, the limits to NSW RFS support during a bushfire had been clearly communicated by the Stoney Creek fire brigade:

When we came out here we knew that we had a responsibility to manage our fire risk and we did what we could to reduce the fuel load and have a good plan in place to save ourselves... We've sometimes found it a bit daunting about how we do all of that... We did not expect that council or the RFS would come in and save us. We believed that it was our responsibility to be aware of the risk and manage it.

- Carwoola

As we found on the 17th of February, there was a limit to the number



of properties they could get to. [Brigade member] has a lovely statistic. He said there were 77 properties in the area. By calling on units as far afield as Cooma and Sydney, the RFS were able to fill 62 vehicles. That's not even one per property. It is an unrealistic expectation that come the fire, the brigade will be here.'

- Carwoola

In contrast, agricultural landholder in Carwoola had developed a plan for how his large farm property would be protected. As part of his plan, he expected to receive assistance from NSW RFS firefighters:

My guys were here, all of my mates and my men were here, but there was no actual RFS help on site. As I arrived the ACT truck left. For the next hour and a bit there was no RFS involvement around this precinct at all. The lowest priority building was a cottage over there, because it was rundown, no one lived in it, and my wife and I stored our excess furniture and keepsakes in it. It was the only house that wasn't attended on the day, it's the only one that burnt down. As far as I'm concerned, it was very low intensity fire through here because there wasn't a lot of grass. But it didn't mean it wasn't going to burn things down. Aircraft were helping, which is fine, to a point, but as far as I was concerned, right up to that point our fire plan was right in place and working from a company perspective, the thing missing was any assistance.

- Carwoola

Residents affected by the Currandooley fire were mostly satisfied with the firefighting response. A number of interviewees commented on the effectiveness of aerial suppression, which they believed saved a number of houses:

I had complete faith in the guys, the firies, complete faith. I guess knowing a couple of them probably helped. Any of them that came knew exactly... 'You tell us what we have to do' and we did it. A lot of the time they went 'No, you're doing a good job. Just keep doing what you're doing.

- Tarago

The helicopters were doing a marvellous job, they helped save this house, they helped save this property, it only got 10 metres into my



place, and the big helicopter, whatever it's called, it helped save this place. Otherwise, God knows what would've been burnt. I mean it just would've kept travelling, we had no means of fighting the fire, which was very frustrating for us because you feel so useless, you can't do nothin'.

- Mount Fairy

Female: It was really good. We were actually really impressed with how everything was handled because the firefighters were originally front line doing what they could. It was just back and forth, back and forth and we were sitting out in the driveway just watching them.

Male: No one stopped. No one wanted to take a sandwich and cigarette or something like that. They fought the fire and they just didn't stop.

- Tarago

A small number of interviewees were critical of the firefighting strategy during the Currandooley fire. One interviewee believed that fire trucks had been deployed to protect houses and that nothing was being done to prevent the spread of the fire:

It was a lot of country, I believe, that shouldn't have burnt that could've been saved. They had the helicopters down there and it just slowly travelled up here and then about 1 or 2:00 it started to pick up pace, the wind come up and then it was just going wherever it wanted to, because there was nobody fighting it.

- Mount Fairy

Another interviewee believed that the fire could have been easily contained had a back burn been lit from Tarago Road or, failing that, the railway line. He did not appear to be in communication with firefighters and was not a NSW RFS volunteer. He drew a diagram to illustrate what was apparently a relatively straightforward undertaking:

The fire that happened over at the wind farm, over there, Taylor's Creek Road. When I first saw it, it was on the side of a few houses over there. They had a great opportunity on the Tarago Road itself, to do a back burn. I thought they would've back burnt there, and stopped the fire... Just drew the diagram there for you. That's where it actually started over there, I'm on the hill watching from here. There's the houses there, this is sort of, the hot-spots in front, of course, coloured. When it started there, there's Tarago Road, I don't know if they're too



scared to light a, to do a back burn these days, you don't see much of it happening. But it should happen. I don't know why they couldn't have stopped it there before it got too big. Then it jumped that Tarago Road and come down the railway line. The railway line's got its own gravel and everything else, it's usually graded both sides of the road, a beautiful spot for a back burn. Along here the actual fire shed is just here. Why didn't they back burn there? This is all open paddocks here, it would've been a good opportunity to have your trucks running along here to slowly bring it into a V and finally put it out with your aeroplanes and your choppers or whatever.

- Mount Fairy

Criticism of firefighting strategy was more common among interviewees affected by the Sir Ivan fire. It is important to recognise that these criticisms reflect interviewees' personal views and, whether they are factual or not, or warranted or not, they provide insights into people's understandings of firefighting and their expectations of the NSW RFS and other emergency services.

Criticisms varied in detail but typical reflected a belief that the NSW RFS prioritised the protection of houses over agricultural properties and assets; and that firefighting strategy was bureaucratic, directed from afar, and overly risk averse. The following interview excerpts are representative of the view that houses were prioritised over agricultural properties and assets:

Afterwards, I was sort of surprised, well not surprised, but the lack of action in protecting the assets between where the fire was and Cassilis. If they knew it was gonna break out, or if it was gonna break out, then you had people reserve tankers and stuff. Well, I think they should've been doled out to all the homesteads in the path of the fire...

- Coolah

Sadly a lot of people said the same thing around here: that their farms just got ignored, and their fire brigades were playing cricket at the school grounds on the Sunday, when the fire was out of control.

- Cassilis

I think when a crisis happens you're always going to be basically on your own. If you're relying upon the system to save you, well, you're going to be disappointed. So, you just do the best you can by yourself. I mean, I would've just liked ... they had two choices. They either commit more resources to stop it down at [property name removed] when it was only in this area here and try to fight it, or if the decision is to give all this country away, they should have publicised that.



- Coolah

This view was echoed by an interviewee in Cassilis, who accepted that the NSW RFS had a duty of care to its firefighters, but believed the decision to 'pull back' should have been more clearly communicated to landholders:

The RFS personnel were at loggerheads with local property owners, because they weren't there on the ground outside the house, protecting the house... The RFS has a duty of care to its volunteers. If they had said "pull back to this point, we'll think you'll be safe." But, rather than communicating effectively to the landholder that this fire is too catastrophic to risk leaving someone here... But the bottom line, as far as I can see, is a lack of communication initially. Unless you were like I was on Saturday night, set in front of the computer and just went from site to site to site, you weren't aware of it.

- Cassilis

Other interviewees acknowledged that the fire was burning under Catastrophic fire danger conditions, but believed it was safe for firefighters to attend agricultural properties to fight the fire. A number expressed frustration that fire trucks could be seen on main roads, but would not come down to assist landholders:

It was moving fast but it really wasn't that dangerous in the grass like out on the paddock where it was burning... When we were fighting it out there, we drove through the front several time in the truck. You could do that quite safely and get on the burnt ground behind and then you have a go at it behind and you might come back out in front of it again. We did that quite a bit so it's not like a forest fire or a scrub fire like the Victorian ones. I wouldn't go into the scrub land to fight. But, out in the grass you could fight it quite well and really be in no danger... Again, all these people who are supposedly trained in the RFS and wearing the overalls, they should be able to be committed to a fire... [have] confidence that they can make some local decisions to look after themselves. They don't need to be told that it's too dangerous and they can't go near it. They should be allowed fight it... If they're not going to be committed, they're not much use to anyone.

- Coolah

There were three tankers sitting on this end of the road with crews and none of them would come and help us because they weren't ... they were never instructed to help us, you know? And I know protocol's gotta be followed but, surely if a fire's coming like that and you've got the tank of water, yeah hop in and help... Or aren't you allowed to hop in and help. I don't know. I don't know why. But there was no way



in the world. And then they just... They just all disappeared to town or wherever... and left us there.

- Coolah

As I said to all the firies and that, we didn't expect them to come here and fight the fire... No, not in front of it. But I sure as hell expected them behind it.

- Cassilis

An interviewee at Cassilis explained why her expectations of the fire service were not met. She believed that fire trucks were told to stay on the bitumen road because they were not suitable for driving down unsealed roads and tracks:

My big problem, post-fire, is that our expectation of what the Rural Fire Service was about was totally false... They had the water, they had the clothing, they had the equipment, they had the money... and they did nothing... If those trucks are useless in rural areas, don't put them in rural areas... [We should] have a Rural Fire Service that can fight fires in rural areas... Anybody could have been killed in that fire and they were still sitting on the road. They would not move.

- Cassilis

Another interviewee explained his view that the fire service had become too bureaucratic and risk averse. He believed that training, qualifications and other 'red tape' was hampering volunteers:

My biggest objection is too much red tape on us. Yeah, that's always been my issue with the Rural Fire Service. With getting people qualified. Courses take too long. Not being allowed to take your own private vehicles to fires and things like that. Response time is absolutely critical. And with only having two trucks, we need to bring five other trucks to that fire as quickly as possible. That's the secret to putting the fire out. Get it out quick. Get there and get it out quick.

- Leadville

Not to be... well, it is being critical but I think it's due to ... well probably an incorrect training strategy, in that the RFS seem now, with the new structures, seem to be slow to react on the ground. They're quick to react in the office as the administration side of it, but it seems to be too big a lag time before they get people on the ground actually fighting.



- Cassilis

I've been on brigades and the local Captains, they know the area like the back of their hand... They've known it for 50 years for god's sake. But that's why there's no old fellas in the fire brigade anymore. There's too much red tape... You've got to go through all the training courses and everything to get on the fire department... You need the old fellow that's the local to say, well there's a gully down there. If you head down there, you go around the back and you beat it there or on this ridge. But see, you don't have any of that anymore. It's all done on the computer.

- Cassilis

However, a local NSW RFS member offered a different interpretation, acknowledging that while he did not always agree with NSW RFS rules and regulations, they were in place for a reason:

Once we turn up there in the fire truck they try to treat us like we're their employees... Well, we're actually not their employees... We've just got to do what we're told to do... Because you're on their land they think that they're in charge... They don't realise that once a red truck turns up, it's a work place. Until a red truck turns up they can do what they like, but once a red truck turns up it becomes a work place and you've got the OH&S and the workers safety rules to apply then...

- Leadville

Indeed, some interviewees did appear to have an expectation that fire trucks could be directed by individual landholders:

Five RFS trucks arrived there with all their flashing lights and bloody sirens, and yellow overalls, and all this sort of shit.... I went up to them and I said, "Look, there's nothing down there, it's all been passed through there. It's gone through there... it's just jumped the road up at Vinegaroy. Could you please go up there?" They said, 'Oh no, we can't go. We've got to get instructions from the control room.' I said, "Well, this is on the ground, this is what's happening!" And then, just after that our local Fire Brigade Captain came along there and he was in a panic and he says, 'Quick, quick, quick, it's just jumped the road up in Vinegaroy! Quick, you can get up there? You can do the job!' 'Oh no, we can't go.'

- Cassilis



The story of volunteer firefighters playing a game of cricket at Cassilis was recited by a number of interviewees. This story contributed to some people's anger about their experiences of the Sir Ivan fire:

One terrible PR thing was when they were saving Cassilis, we were out here trying to save our horses... All the people that way, the only reason they've still got their houses is they were there when the fire went through and put it out. There were blokes in Cassilis playing cricket. They had trucks all around Cassilis... It's made people's blood curdle...

- Cassilis

But some of 'em were sittin' up in the school grounds up here, the trucks and that, the fire trucks, playing cricket. Cause they didn't know where to go, they had nobody directing them. Nobody was directing them where to go to.

- Cassilis

There was another group of them went there to Cassilis, and they were in Cassilis town playing fucking cricket, believe it, playing cricket while the firemen were out there doing all the work. Bloody ridiculous.

- Cassilis

4.12 LOCAL KNOWLEDGE AND PARTICIPATION

A number of interviewees offered suggestions for how local knowledge and participation could be better incorporated into bushfire management. These included:

- Allowing residents more control over vegetation clearance:

There's another lesson though to this, which is one for government, but government seems to be oblivious to it, and that is that land owners, in rural residential properties anyway, should be encouraged, allowed to do the fire reduction themselves without the petty restrictions that apply. For example, the tree preservation order in this area, which is the state government regulation, requires that you seek permission to do anything to a tree after it's a certain height, two metres or something of that order... If I spent my times going around asking for permission to do everything for every tree on this property, which I thought was a fire threat, I don't know how much time it would take, but if you add that up by the number of rural residential people around here, the law is an ass, and I'm quite prepared to say that on tape. It's just ridiculous, so we fuel reduce... And there are more trees on this property than when we arrived, there is more wildlife on this property than when we arrived... But, the governments at the moment



do not use a carrot and stick approach, it's all stick.

- Carwoola

- Making better use of private firefighting units:

Unless you've been and done all of the training units for RFS, you don't know what you're doing. That's the perception that's coming from RFS. They don't like us there doing what we do. I think RFS are so concerned about someone getting killed or injured that they'd rather people don't go into any fire situation until they think that they can control it. It's not what you're dealing with, it's unpredictable, that's fire. Blokes like me that have never been RFS members, but I've been on the land for 35 years know as much about fire as anybody, and I can cut a tree down, and I can do all that, I can drive any truck, without necessarily having an RFS ticket. We've had fires here over the years where they've rolled in, but we can't go and do anything because they're waiting on someone with a licence to drive the big truck, and the guy with the chainsaw ticket is there too, and they can't get here. You can't operate that way. You've either got to up the level of training, or you've got to accept that people that aren't trained in RFS have something to contribute. 30% of the blokes standing at that roadblock could have contributed. Even though they don't have a jacket to wear or a card in their pocket...

- Carwoola

- Greater local input into decision-making on the fire ground:

I think the guy in charge, you captain of your truck, has got to be able to make a call on the ground. He's got to be able to make a decision and say, "Yes I can do something, I can be effective in this point" and he's got to have the training to be able to have the responsibility of making a call that's effective and safe for these people he's looking after. If you give command, more command to people on the ground who are actually looking at the fire right there, they can see it, they know where to go. If they can be more independent and more effective on the ground, I think that they'll get a better outcome in this area, in these sort of conditions.

- Cassilis

- NSW RFS to share community images and information from the fire ground:

From the RFS point of view, they could probably do pretty well if they had someone on the ground whose job it was, not to fight fire but to upload immediate [images]... These days the community is a tool. If



someone's on the ground and they can take a phone and get [information] on to people, other people's phones in minutes. A lot of people can draw from that raw information, and with that know exactly where the fires are and how it's going. Someone whose job it is to pick particular points, photographs, and real short comment, 'This is the fire, this is going this direction,' that's valuable to everybody on the ground.

- Cassilis



5. DISCUSSION AND CONCLUSIONS

This report has examined issues of community preparedness and responses to bushfires in NSW in 2017. Through semi-structured interviews with people affected by the Currandooley, Carwoola and Sir Ivan bushfires, and an online survey of people living in bushfire risk areas across NSW, the research provides insights into a range of community bushfire safety issues. These include issues related to: the effectiveness of warnings delivered to the community; the delivery of Catastrophic Fire Danger messages; information people sought out in relation to bushfires; the drivers and motivators for those who sought to enter or re-enter fire grounds; people's perceptions of risk; how people value assets and prioritise their protection; the influences of previous fire history or experience on decisions and actions; public expectations of fire and emergency services; and opportunities for greater utilisation of local knowledge and participation.

Key findings from the analysis of interview and survey data include:

1. Effectiveness of warnings delivered to the community

Most people found warnings easy to understand, up-to-date and useful. Survey respondents and interview participants expressed a preference for highly localised information. Fires Near Me was seen as the most useful information source. Limited mobile phone coverage, particularly in the Sir Ivan and Currandooley fires, meant that some people did not receive SMS warnings in a timely manner.

2. Did warnings and information assist people to reduce risks to agricultural assets

The time between ignition and the fire becoming a threat to life and property was an important difference between the fires in Currandooley and Carwoola and the Sir Ivan fire. The Currandooley and Carwoola fires threatened communities within hours of ignition. Two large agricultural landholders in these fires received notification of the fire and returned during the fire to protect their farms. In the Sir Ivan fire, which began on the Saturday and mostly threatened communities on the Sunday, most landholders were aware of the fire when they received warnings and had time to make last minute preparations and respond.

3. Delivery of Catastrophic Fire Danger messages

Most people found Catastrophic Fire Danger warnings easy to understand, timely and useful. They typically responded to these warnings by discussing the threat with family, friends or neighbours and looking for information about bushfires in their area. Many people believe it is impractical to leave on days of Catastrophic Fire Danger before there is a fire. Many are also committed to defending, despite being aware of the increased risks to life on these days.

4. Information sought out relating to the fires

Interview data highlight the importance of local social networks in the dissemination of warnings and information, and the multi-source and ongoing information seeking that occurs once people become aware of a fire. Most people do not rely on one source of warning, particularly where mobile phone



coverage is known to be limited. Data also highlight the tendency for people to leave their homes and properties to go and look at the fire. Observing the fire appears to have helped people ready themselves to defend, or confirmed the need to leave.

5. Drivers and motivators for entering fire grounds

The main reasons people enter fire grounds are to protect houses and property, rescue or assist vulnerable people; and protect animals. While some people complied with roadblocks, others passed through or circumvented them in order to return. Some people used back roads and gates through private property to return, sometimes on foot or in vehicles that were unsuitable for roads, tracks and paddocks. There was a perception that some people were exposed to more danger than if they had passed through the road block.

6. Perceptions of risk

Analysis of interviews with people affected by the Carwoola and Currandooley fires suggests that some may have underestimated the risks to life and property because fire danger conditions were not Catastrophic. In the Sir Ivan fire, where fire danger conditions were Catastrophic, many based their expectations on past experience with smaller fires and therefore did not anticipate the size or severity of the fire. Many felt that they were prepared to respond to smaller, 'normal' fires, but that there was little they could do to prepare for a fire of the size and severity of Sir Ivan.

7. Responses by the community and prioritisation of protective responses

Around half of the survey respondents who were threatened or impacted by bushfire in 2017 left or were away from their house or property during the fire. The other half stayed to defend or shelter on their property. Those who left prioritised the protection of life, even if it meant losing a house or property. Those who stayed usually did so to protect property and protect livestock and other animals. Many hobby farms, small acreages and large farm properties were significantly underinsured. Insurance of fences and livestock were seen as particularly cost-prohibitive.

8. Perceptions of risk to and value of agricultural assets vs. homes

Interview data demonstrate considerable variability in how agricultural landholders value and prioritise the protection of agricultural assets relative to homes. Some landholders do prioritise protection of livelihood assets due to their greater financial worth, while others prioritise protection of houses due to personal or sentimental values. Interviews with agricultural landholders highlighted how, during an actual bushfire emergency, people will assess what they can realistically protect with the time and resources they have at their disposal.



9. Influences of previous fire history and experience on planning, preparedness and decisions

Survey data suggests there is a link between bushfire experience, such as being a volunteer fire fighter, and greater planning and preparedness (although further research is needed to confirm this relationship statistically). As discussed above, experience with smaller, less destructive bushfires mean that some people did not anticipate the size and severity of the Sir Ivan fire. For many, preparedness levels seem to have been based on an expectation of a 'normal' bushfire. Experiences and memories of the 2003 Canberra bushfires and the 2009 Victorian Black Saturday fires also influenced people's perceptions of risk, planning and preparedness.

10. Identified intervention strategies

Some interviewees provided insights into community engagement initiatives that were happening in their areas. Members of the Stoney Creek NSW RFS brigade capitalised on renewed interest and engagement after the fire by running whole-day community preparedness workshops and establishing a 'Hotspots café' social group that meets over coffee to discuss bushfire and other issues.

11. Public expectations of emergency services

While limitations to NSW RFS support due to resource constraints are generally well understood (e.g. there are not enough trucks for every property), there is less appreciation of operational constraints imposed by Fire Danger conditions, fire behaviour and health and safety obligations. Residents in Carwoola were particularly cognisant of the limits to NSW RFS support, which had been clearly communicated by the local brigade over time.

Some interviewees affected by the Sir Ivan fire were critical of the firefighting response. It is important to recognise that these criticisms reflect interviewees' personal views and, whether they are factual or not, or warranted or not, they provide insights into people's understandings of firefighting and their expectations of the NSW RFS and other emergency services. Criticisms varied in detail but typical reflected a belief that the NSW RFS prioritised the protection of houses over agricultural properties and assets; and that firefighting strategy was bureaucratic, directed from afar, and overly risk averse. These criticisms should also be viewed in the context of a large, destructive bushfire that burnt under Catastrophic conditions.

12. Local knowledge and participation

Interviewees offered suggestions for how local knowledge and participation could be better incorporated into bushfire management, including: allowing residents more control over vegetation clearance; making better use of private firefighting units; greater local input into decision-making on the fire ground; and for the NSW RFS to share community images and information from the fire ground.



The findings presented in this report have numerous implications and present possible opportunities for NSW RFS communications and community engagement. These include:

- The research confirms the tendency for people to observe the fire directly to ready themselves to defend or confirm the need to leave. This behaviour presents opportunities for emergency service personnel to meet people at a time when they are seeking and receptive to information and advice. Such meetings could occur at locally known observations points, or at locations designated by emergency services.
- There is a need to more clearly communicate the risks posed by fires burning under non-Catastrophic Fire Danger conditions. Such messages could be incorporated into community education and engagement resources, as well as emergency warnings and information.
- There is potential to develop additional resources to assist agricultural landholders to plan and prepare for bushfire. Resources are needed to help businesses more systematically identify assets and values, prioritise, and plan for their protection. These materials could include 'Best practice' case studies and information about insurance.
- There is a need to more clearly communicate the limits to NSW RFS response capacity. In addition to limitations due to resource constraints, which are generally well-understood, there is potential for enhanced communication of operational constraints imposed by Fire Danger conditions, fire behaviour, and associated imperatives such as Occupational Health & Safety requirements. Findings suggest that local brigades can be effective in communicating these messages; however, this may require considerable engagement and training at a time when some NSW RFS members are finding training and time commitments challenging.



REFERENCES

Bradfield, A. and Wells, G.L. (2005) Not the same old hindsight bias: outcome information distorts a broad range of retrospective judgements. *Memory & Cognition* 33, pp. 120-30.

Vinson, T. and Rawsthorne, M. (2015) *Dropping off the Edge 2015: persistent communal disadvantage in Australia*. Jesuit Social Services and Catholic Social Services Australia. Available from: <http://www.dote.org.au> [last accessed 01/12/2017].



ACKNOWLEDGEMENTS

We acknowledge with gratitude the participation of the people affected by the Currandooley, Sir Ivan and Carwoola bushfires. Without exception, people willingly and honestly shared their thoughts and experiences. We also acknowledge and thank the many people throughout NSW who participated in the online survey.

Many people contributed to the research, including in the field, in logistics, intellectual support, leadership and countless other ways. Our sincere thanks go to all who contributed, including those not named below.

We sincerely thank Christine Eriksen (University of Wollongong), who contributed to development of the interview guide and provided valuable advice in the early stages of the research. Carrie Wilkinson (University of Wollongong), Megan McCarthy and Julia Irwin (Macquarie University), and Chris Bearman (Central Queensland University) assisted with the interviewing of people affected by the fires, and Ville Santala (University of Wollongong) assisted with data analysis.

We thank all at the Bushfire and Natural Hazards Cooperative Research Centre for their support of the project, in particular Michael Rumsewicz, Leanne Beattie, Nathan Maddock and John Bates.

Finally, the research would not have been possible without the support of the NSW Rural Fire Service. In particular, we would like to thank Anthony Clark and Anthony Bradstreet for their support and assistance throughout the project. We are also grateful to Merryn Campbell and Stephen Glassock for their management of the project. We also thank Greg Allan, Bradley Bourke, Merryn Campbell, Tony Jarrett, James Morris and Jacqueline Murphy for their assistance with the field work. We are especially grateful to and acknowledge the support of Tim Carroll and Darren Marks (Lake George District), Corey Phillip (Castlereagh Zone) and Tim Butcher (Liverpool Range Zone) for promoting the research within their communities and providing crucial logistical and practical support.



APPENDIX 1: INTERVIEW GUIDE

Note: Participants are likely to answer many of these questions in a non-chronological order without being prompted.

LEAD UP TO THE FIRE

- When and how did you become aware of the fire? (timing, warnings, sources)
- Were you or anyone else at home in the lead up to the fire?
- What did you do once you became aware of the fire?
- How long did you have between first warning and actual impact? (immediate impact, hours, days)
- Had you prepared for bushfire?
- Did you have a bushfire survival plan? (no, mental, written, discussed, practiced, back-ups, place of last resort)
- Did you do any last minute 'tune-ups' to your property?
- Did you leave or stay? (leave early/late, stay and defend, wait and see, shelter in place)

DURING FIRE

- If left:
 - When did you leave?
 - What were your trigger points? (warnings, evacuation order, embers, smoke, noise, flames)
 - Where did you go?
 - How did you get there?
 - How did you stay informed during the fire?
 - How long after the fire did you return?
- If stayed:
 - Did you stay because you had planned to or could you not get out?
 - How many people were present?
 - Did everyone actively attempt to defend?
 - Did you have dependants, pets or livestock to care for?
 - What was the biggest threat to the property? (embers, radiant heat, flame contact)
 - Did your plan / preparation work? (why/why not?)
 - Did you at any point doubt your own or other people's actions?



- Were you able to actively defend at all times or did you seek shelter?
 - (if relevant) Where?
- Did you get any help?
- Did you help anyone?
- Were fire agencies present at any time?
 - If so, did they actively defend your property? (before, during, after the fire front, not present)
- What did you do after the fire front passed? (stayed to monitor and mop up, left: if so, when did you return?)

AFTERMATH OF THE FIRE

- How much damage did the bushfire cause to your property? (casualties, vegetation, buildings, livestock)
- (if relevant) Do you think you will rebuild/replace? (why/why not?)
- Do you have insurance to assist you in recovery?
- In hindsight, what was instrumental in making you cope with the fire's impact?
- What do you know now that you wish you had known before the bushfire?
- Is there anything you would do differently in future bushfires?



APPENDIX 2: INTERVIEW PARTICIPANT INFORMATION SHEET

Community Preparedness and Responses to the 2017 Bushfires in NSW



UNIVERSITY
OF WOLLONGONG
AUSTRALIA

This is an invitation to participate in an interview conducted by the Centre for Environmental Risk Management of Bushfires at the University of Wollongong. The interview is part of a research project that explores community preparedness and responses to the 2017 bushfires in NSW. You have been invited to participate in an interview because of your knowledge, as a resident or firefighter, of responses to the 2017 bushfires.

Methods and Demands on Participants

If you choose to participate in a semi-structured interview (more like a focused conversation), an interview will be scheduled at a time, date and location that is convenient to you. The interview will take approximately one hour and, with your permission, will be audio recorded. Handwritten notes can be taken if you would prefer not to be audio recorded. The interview will focus on community preparedness and responses to the 2017 bushfires in NSW. Examples of possible interview questions include: 'How did you first find out about the fire?', 'What did you do during the fire?' and 'How did the fire affect you and your family or household?'

Possible Risks, Inconveniences and Discomforts

Approximately one hour of your time will be required for the interview. Reliving a bushfire experience can be emotionally distressing. You will not be pressured for details you feel uncomfortable talking about. Your involvement in the study is voluntary and you may withdraw your participation from the study at any time and withdraw any data have provided to that point. Withdrawal from the research or refusal to participate will not be shared with anyone outside the research team and will not affect your relationship with the University of Wollongong, Macquarie University or the NSW Rural Fire Service. Please notify any of the researchers listed at the end of the Participant Information Sheet in writing if you would like to withdraw from the study.

The privacy of interview participants is ensured (personal details such as names and addresses will never be disclosed in any published material). While discussion of sensitive topics is not anticipated, recollecting aspects of an emergency can be emotionally distressing. Should you require emotional support, Lifeline Australia provides 24 hours a day telephone crisis support during and after natural disasters: call 13 11 14 or see <https://www.lifeline.org.au/Get-Help/Facts--Information/Recovering-after-a-natural-disaster/>

Funding and Benefits of the Research

This study is funded by the Bushfire and Natural Hazards Cooperative Research Centre (www.bnhcrc.com) and the NSW Rural Fire Service. Findings will be used



to inform strategies to improve community preparedness and responses to bushfires. Findings from the study will be communicated to the NSW Rural Fire Service via a written report and will be published in scholarly publications (e.g. journals, conference proceedings). The confidentiality of interview participants is ensured (personal details, such as names and addresses, will not be disclosed).

Ethics Review and Complaints

This study has been reviewed by the UOW Human Research Ethics Committee (ref. 2016/1017). Ongoing monitoring of the research is the responsibility of the researchers listed above, and annual reports are submitted by the researchers to the UOW Research Ethics Unit. If you have any concerns or complaints regarding the way this research is or has been conducted, you may contact the UOW Ethics Officer on 02 4221 4457 or via e-mail: rso-ethics@uow.edu.au

Thank you for your interest in this study. Please contact Dr Josh Whittaker using the details below if you would like to arrange an interview, or if you have any further questions.

Dr Joshua Whittaker

Research Fellow

Centre for Environmental Risk Management of Bushfires

University of Wollongong, NSW 2522, Australia

Ph: 02 4221 1220 / Mob: 0409 007 842 / Email: wjoshua@uow.edu.au

Dr Mel Taylor

Senior Lecturer

Psychology

Macquarie University

Ph: 02 9850 8105 / Email: mel.taylor@mq.edu.au



APPENDIX 3: ONLINE SURVEY INSTRUMENT

You are invited to participate in research being conducted by the University of Wollongong for the Bushfire and Natural Hazards Cooperative Research Centre (www.bnhcrc.com.au) and the NSW Rural Fire Service (RFS). This project is being undertaken with the objective of improving community bushfire safety.

The online questionnaire can be completed by anyone who lives in a bushfire prone area of NSW, as well as anyone directly threatened or impacted by bushfires in NSW during the summer of 2016-2017.

The questionnaire will take approximately 20-40 minutes to complete and contains questions about your preparedness and responses to bushfires during the summer of 2016-2017. The questionnaire is anonymous.

This project is being undertaken so that NSW Rural Fire Service can develop a better understanding of how to improve community safety for the future. A report with recommendations for improving community bushfire safety will be written for the NSW Rural Fire Service. Findings from the research may be reported at scientific conferences and in research journals. No identifiable material will be included in any reports.

Your involvement in the study is voluntary and you may withdraw your participation from the study at any time and withdraw any data that you have provided to that point. Recollecting aspects of a bushfire can be emotionally distressing. Should you require support, Lifeline Australia provides telephone crisis support: call 13 11 14 or see <https://www.lifeline.org.au/Get-Help/Facts---Information/Recovering-after-a-natural-disaster/Recovering-after-a-natural-disaster>

If you have any questions about the study you are welcome to contact Dr Josh Whittaker (Email: wjoshua@uow.edu.au) from the University of Wollongong.

This study has been approved by the University of Wollongong Human Ethics Committee. If you have questions which Dr Josh Whittaker has been unable to answer to your satisfaction, or you have concerns or complaints about the conduct of this study, you may contact the Secretary, Human Ethics Committee, on 02 4221 3386 or email rso-ethics@uow.edu.au. Please quote the application reference number 2017/216.

Thank you for your interest in the research.

[UOW logo, BNHCRC logo, RFS logo]



1. To participate in this online survey, you:
 - Must be over 18 years of age
 - Need to complete the questionnaire by 24 September 2017
 - Understand that the questionnaire takes approximately 20-40 minutes to complete
 - Understand that all questions are optional
 - Understand that the survey is anonymous
 - Understand your right to cease participation at any time

- By ticking this box you indicate that you are 18 years or older and have read the information provided above, that you agree to participate in this study, and that you consent to the data being used as described above.
- I do not wish to proceed.

Part 1: About you and your property

In this section we would like to find out about you and your household as it was at the beginning of last summer. This information is collected for statistical purposes only.

2. What is your gender?
 - Male
 - Female
 - Prefer not to say
 - Other (please specify)
 -
 -
3. What is **YOUR** age?
 - 18-24
 - 25-34
 - 35-44
 - 45-54
 - 55-64
 - 65-74
 - 75+



4. What is the postcode of your house or property?

5. Which of the following best describes your house or property?
 - House or unit on residential block
 - House on a hobby farm or small acreage
 - House on a large farm property
 - Land without a house (Go to Q9)
 - Other (please specify)

6. If known, in what year was the house built?
[Free text box]

7. How long have you lived at this house or property?
 - 0-5 years
 - 6-10 years
 - 11-20 years
 - Over 20 years
 - Do not live at property

8. What type of residence is this for you?
 - Main residence
 - Secondary residence
 - Other (please specify)
 -
 -
 -

9. Did you own or rent this house or property?
 - Own (with or without a mortgage)
 - Rent
 - Manage
 - Other (please specify)

10. What was the composition of your household?
 - Couple with children or other dependents
 - One adult with children or other dependents
 - Couple without children or other dependents
 - One person household
 - Shared house with other adults
 - Other (please specify)



11. What animals did you have on the property? (Select all that apply)

- No animals
- Pets/Companion animals
- Working/service dogs
- Horse/s
- 'Pet' livestock
- Commercial livestock
- Other (please specify)

Please provide details of the types and numbers of animals you had at the beginning of last summer [free text box].

12. At the beginning of last summer, were you a member of the NSW RFS?

- Yes, I was a NSW RFS member
- No, but I had been a NSW RFS member in the past
- No, I had never been a NSW RFS member

13. At the beginning of last summer, were you a member of a Community Fire Unit?

- Yes, I was a member
- No, but I had been a member in the past
- No, I had never been a member

Part 2: Your planning and preparation

In this section we would like to find out about your planning and preparation for bushfires during the summer of 2016-2017.

14. At the beginning of last summer, how likely did you think it was that a bushfire could occur in your local area?

- Very unlikely
- Unlikely
- Likely
- Very likely
- Hadn't thought about it



15. At the beginning of last summer, how did you rate the threat from bushfires to your property?

- Very low
- Low
- Moderate
- High
- Very high
- Hadn't thought about it
-
-

16. At the beginning of last summer, how did you rate the threat from bushfires to your household members' safety?

- Very low
- Low
- Moderate
- High
- Very high
- Hadn't thought about it
-
-

17. At the beginning of last summer, how did you rate the threat from bushfires to your business or livelihood and associated assets (e.g. farm, machinery, livestock)?

- Very low
- Low
- Moderate
- High
- Very high
- Hadn't thought about it
- Not applicable



18. At the beginning of last summer, which of the following best described your previous experience with bushfire? Please select all that apply.

- I had left early or evacuated due to bushfire
- I had defended my house or property against bushfire
- I had sheltered inside a house or other structure during a bushfire
- I am/had been a paid firefighter
- I am/had been a volunteer firefighter
- I had used fire as a tool for managing land on my property
- My house had been damaged by a bushfire
- My house had been destroyed by a bushfire
- My property (other than a house) had been damaged or destroyed by a bushfire
- My business or livelihood had been impacted on by a bushfire
- I did not have any previous experience with bushfire
- Other (please specify)
 -
 -

19. At the beginning of last summer, which of the following best described your level of planning for bushfire?

- Never thought about what I would do if a bushfire occurred
- Knew I should think about what to do, but hadn't
- Had thought about it but was still deciding what to do
- Had thought about it and decided I didn't need to do anything
- Had decided what to do and was thinking about how to make it work
- Had made a firm plan about what to do if a fire occurred
- Other (please specify)

20. Before the beginning of last summer, had you or other household members read the NSW RFS Guide to making a Bushfire Survival Plan?

- Yes
- No (Go to Q22)
- Not sure/can't remember (Go to Q22)



21. Which of the following best describes how you or other household members used the NSW Guide to Making a Bushfire Survival Plan?

- Wrote down a plan for what to do during a fire
- Discussed what to do during a fire
- Used it for general information about bushfires
- Read it but did not make a plan
- Other (please specify)

22. What information sources did you or other household members use to prepare your plan? Please select all that apply

- Not applicable – didn't prepare a plan
- NSW RFS website
- MyFirePlan.com.au website
- NSW RFS Household Assessment Tool
- NSW RFS guide to making a Bushfire Survival Plan
- NSW RFS Checklists
- Information from family, friends or neighbours
- Information from local brigade/firefighters
- Information in the media
- Information from my local council
- Independent websites
- Books
- NSW RFS events, training and programs
- Common sense
- Other (please specify)
- None of the above

23. What was the **most useful** information for helping your household plan and prepare for bushfire?

[Free text box]



24. At the beginning of last summer, which of the following best described your household's plan?

- All household members leave
- All household members shelter
- All household members stay and defend
- Some household members leave, others stay and defend
- Some household members leave, others shelter
- Some household members stay and defend, others shelter
- Wait to see what the fire is like before deciding what to do
- No plan
- Other (please specify)

25. Given what you intended to do if a bushfire occurred in your local area, had you...

- [Response options: Yes; No; Not sure/can't remember; Not Applicable]
- Developed a written plan, or a list of things to do and remember
- Discussed what you would do with other members of the household?
- Practiced or rehearsed the plan?
- Considered what to do with pets, animals or livestock
- Considered how things could change if some members of the household were not at home?
-

26. Had you identified a place (or places) to shelter as a backup?

- Yes
- No

If yes, where? (please specify)

27. Do you know of the term 'Neighbourhood Safer Place'?

- Yes
- No (Go to Q30)
-



28. Is there a Neighbourhood Safer Place in your area?

- Yes
- No
- Not sure
-

29. If yes, where is the Neighbourhood Safer Place?

[free text box]

30. Which of the following had you or other household members done to **prepare** for bushfires?

[Response options: Yes; no; not applicable]

- Cleared leaves, twigs and long grass for a distance of about 20-30m around house
- Removed vegetation close to the house
- Moved combustible materials such as firewood and garden furniture away from the house
- Cleared gutters of leaves
- Installed gutter guards or protection
- Had a water supply independent of the mains such as a dam, water tank or swimming pool that can be used for firefighting
- Had a power supply independent of the mains (e.g. generator or solar cells)
- Covered gaps, underfloor spaces and vents to reduce the risk of embers entering the house or cavities (e.g. roof, wall etc.)
- Obtained and prepared firefighting equipment (e.g. hoses and a pump)
- Obtained and prepared domestic equipment such as ladder, buckets and mops
- Had a slip-on, tanker trailer or other mobile firefighting unit
- Installed seals and/or draft protectors around windows and doors
- Installed a sprinkler system on the roof
- Prepared a kit of protective clothing for each member of the household



- Prepared an emergency kit such as a torch, radio and medicines
- Prepared a safe area for pets, animals or livestock
- Reduced fuel load in key areas of my property
- Established and maintained fire breaks around my property and key assets
- Conducted hazard reduction burns
- Other (please specify)

31. At the beginning of last summer, what insurance coverage did you have?
[response options: fully insured; partially insured; not insured; not applicable]

- House
- Contents
- Vehicles
- Farm
- Business
- Other (please specify)

32. How would you rate your level of preparedness for bushfire last summer?

- Very high
- High
- Moderate
- Low
- Very low

33. Which of the following best describes your feelings about your level of preparedness for bushfire last summer?

- I had done everything I could to prepare (Go to QX)
- I was well prepared, but there were a few other things I could have done
- I had made some preparations, but there was a lot more I could have done
- I had made little or no preparation

34. What else could you have done to prepare for bushfire last summer?

[open text]



Part 3: Official warnings about Catastrophic Fire Danger

35. Sunday the 12th of February was a day of Catastrophic Fire Danger for the Central Ranges, North Western and Greater Hunter Fire areas.

Did you receive an official warning via SMS or telephone prior to February 12th about the Catastrophic Fire Danger in your local area?

- Yes
- No
- Not sure/can't remember (Go to Q38)
- Not applicable (I do not live in these areas) (Go to Question 38)
-
-

36. What did you do in response to receiving the official warning about the Catastrophic Fire Danger?

- Discussed bushfire threat with family, friends or neighbours
- Looked for information about bushfires in my area
- Looked for information about how to prepare for bushfires
- Got equipment ready to protect the house and/or property
- Began preparing to leave
- Left house or property for a place of relative safety
- Other (please specify)
- Did not do anything

•

37. Was the information provided in the Catastrophic Fire Danger warning

- Timely
- Easy to understand
- Useful

•

Please use the box below if you have any comments about the Catastrophic Fire Danger warning.

[insert box]



38. Which of the following best describes what you would do if a Catastrophic Fire Danger warning was issued for your local area next summer?

- I would leave before there is a fire
- I would get ready to stay and defend
- I would wait until there is a fire, then leave
- I would wait to see if there is a fire, then decide what to do
- A Catastrophic Fire Danger warning would not influence what I do
- Other (Please specify)
-
-

39. Were you impacted or threatened by a bushfire in your local area last summer?

- Yes (Go to Q40)
- No (Go to Q101)

Part 4: What happened on the day of the bushfire

In this section we would like to find out about how YOU responded when you were threatened by the bushfire.

If other household members had a different experience they would like to share, we encourage them to complete the questionnaire separately.

40. Which of the recent fires threatened or affected your house or property?

- Currandooley
- Carwoola
- Sir Ivan
- Pappinbarra
- Dondingalong
- Boggabri
- White Cedars Road
- Other (please specify)



41. How did you **first** find out that a bushfire was threatening your home or property?

- Received official warning via radio
- Received official warning via TV
- NSW RFS Fires Near Me app
- NSW RFS website
- Official warning via SMS or telephone
- Told by emergency personnel (e.g. police, SES, firefighters)
- Told by family, friends or neighbours
- RFS brigades radio or pager
- Social media (e.g. Facebook, Twitter)
- Heard siren
- Smelled or saw smoke
- Saw embers landing
- Saw flames
- Other (please specify)

42. Were you at your house or property when you found out about the bushfire?

- Yes (Go to Q45)
- No
-
-

43. Did you **try** to return to your house or property?

- Yes
- No (Go to Q45)

Why/why not?

44. **Did** you return to your house or property?

- Yes
- No
-
- If no, why not? (Please specify)



45. Did you receive an official warning about the bushfire on your landline telephone, such as a recorded voice message?

- Yes
- No (Go to Q47)
- Not sure/can't remember
-
-

46. Was the information provided in the landline telephone warning...
[response options: yes/no]

- Timely?
- Up to date?
- Easy to understand?
- Sufficiently localised?
- Useful?
-
-

47. Did you receive a SMS (text message) warning from an official source on your mobile phone?

- Yes
- No (Go to Q49)
- Not sure/can't remember

48. Was the information provided in the SMS warning...
[response options: yes/no]

- Timely?
- Up to date?
- Easy to understand?
- Sufficiently localised?
- Useful?

49. Did you receive warnings or information via the radio?

- Yes
- No (Go to Q51)
- Not sure/can't remember

50. Was the information provided on the radio...
[response options: yes/no]

- Timely?
- Up to date?
- Easy to understand?
- Sufficiently localised?
- Useful?



51. Did you access warnings or information via 'Fires Near Me' website or app?

- Yes
- No (Go to Q53)

52. Was the information provided on 'Fires Near Me'...
[response options: yes/no]

- Up to date?
- Easy to understand?
- Sufficiently localised?
- Useful?

53. Did you access warnings or information via the internet?

- Yes
- No (Go to Q56)
-

54. What information were you looking for on the internet? Please select all that apply.

- Information about weather conditions
- Information about the location of the fire
- Information about likely time of impact
- Information about what to do
- Information about where to go (e.g. evacuation centres)
- Information about roads (e.g. traffic, road blocks)
- Information about firefighting activities
- Other (please specify)

55. What websites did you use?

[free text box]

56. Did you use social media (e.g. Twitter, Facebook) during the fires?

- Yes
- No (Go to Q58)
-
-
-

57. What was the most useful source of information (either 'official' or 'unofficial') on social media?

- [free text box]



58. Did you attend any community meetings held in relation to the recent fires?

- Yes
- No (Go to Q60)
- None in my area (Go to Q60)
-
-

59. At the meeting:

- Was the information useful?
- Did you discuss the situation with neighbours or nearby residents?
- Did you have difficulty seeing or hearing?
- Did the information help you decide what to do?

60. Did you watch or listen to any of the live updates, interviews or media conferences from the NSW RFS during the fires?

- Yes
- No (Go to Q63)
-
-

61. How did you access the live updates, interviews or media conferences from the NSW RFS?

- Television
- Radio
- Internet stream
- Other (please specify)
-
-

62. How would you describe the live updates, interviews, or media briefings?

[Response options: yes/no]

- Useful
- Easy to understand
- Sufficient local information
- Accurate
- Timely
- Relevant

63. Thinking about your experience of the fire as a whole, what was the most useful source of information? [Select one only]

- Facebook
- Twitter
- RFS website
- 'Fires Near Me' app
- Local radio



- National radio
- Television
- Family or friends
- Local RFS volunteers
- RFS Bushfire Information Line
- Other (please specify)

64. For future fires, what are your preferred methods for receiving information or warnings?

[response options: first preference; second preference]

-
- Radio
- TV
- Recorded phone message
- SMS
- Twitter
- Facebook
- Mobile phone app
- Other (please specify)

65. Please use the box below if you have any further comments about warnings and information provided about the fires.

[free text box]

66. Before we ask about what YOU did during the bushfire, we would like to know what OTHER MEMBERS of your household did. Please select all that apply.

If you live in a one person household please go to QX.

- Left before the fire arrived
- Left when the fire arrived
- Stayed and defended the house and/or property
- Began defending the house and/or property from the fire but left
- Stayed to defend the house and/or property but the fire never arrived
- Did not defend but stayed and sheltered inside the house
- Did not defend but stayed and sheltered in a structure (other than a house) or vehicle



- Did not defend but stayed sheltered somewhere outside
- Not at home (or on property) for reasons other than the fire
- Other

67. Were there members of your household who needed looking after during the bushfire? You may select more than one.

- Yes, infants or children
- Yes, elderly person/s
- Yes, disabled person/s
- Yes, ill person/s
- Yes, other able-bodied adults who became ill or stressed during the fire
- Yes, other (please specify)
- No

68. Which one of the following best describes what **YOU** did during the bushfire? Select one only.

- Left before the fire arrived (Go to Q69)
- Left when the fire arrived (Go to Q69)
- Stayed and defended the house and/or property (Go to Q78)
- Began defending the house and/or property but left (Go to Q78)
- Stayed to defend the house and/or property but the fire never arrived (Go to Q78)
- Did not defend but stayed and sheltered inside a house (Go to Q78)
- Did not defend but stayed and sheltered in a structure (other than the house) or vehicle (Go to Q78)
- Did not defend but stayed and sheltered somewhere outside (Go to Q78)
- Not at home (or on property) for reasons other than the fire (Go to Q96)



QUESTIONS ABOUT LEAVING

[Respondents are directed to this section if they select option 1 or 2 to Q68]

69. Why did **you** leave your house or property before or during the bushfire?

Please select all that apply.

- It was a day of high fire danger
- I saw/smelled smoke nearby
- My plan is to leave as soon as I know there is a fire
- I received an official warning via SMS or telephone call
- I saw flames nearby
- To go and fight the fire with the fire brigade
- To go and fight the fire with neighbours or other landholders
- Police, fire or emergency services advised me to leave
- Relatives, friends or neighbours advised me to leave
- I wanted to remove other household members or visitors from any potential danger
- I felt it was too dangerous to stay at my house and/or property
- My house caught on fire
- To help relatives, friends or neighbours
- To evacuate animals (livestock, pets etc.)
- Left for other reasons (e.g. work, shopping, visiting friends)
- Other (please specify)

70. Before the fire, where did you think you might go if there was a bushfire?

- Another house in my local area (e.g. a neighbour or friend's house)
- Another house further away (e.g. family or friend's house)
- Another building in my local area, such as a community hall or shops
- An open area in my local area, such as a paddock, reserve or oval
- A nearby town that is safe from the fire
- An evacuation centre
- A Neighbourhood Safer Place
- Hadn't thought about it
- Other (please specify)



71. When you left, where did you actually go?

- Another house in my local area (e.g. a neighbour or friend's house)
- Another house further away (e.g. family or friend's house)
- Another building in my local area, such as a community hall or shops
- An open area in my local area, such as a paddock, reserve or oval
- A nearby town that was safe from the fire
- An evacuation centre
- A Neighbourhood Safer Place
- Other (please specify)

72. When you left, did you feel that the danger was...?

- Very high
- High
- Moderate
- Low
- Very low
-
-

73. When leaving, did you experience any difficulties associated with any of the following? Select all that apply.

- Poor visibility
- Smoke
- Embers
- Flames
- Traffic
- Fallen trees
- Had a car accident
- Official road block
- Other (please specify)
- None of the above



74. How long were you away from your house or property?

- Less than an hour
- A few hours
- Overnight
- 1-2 days
- More than two days but less than a week
- A week or more

75. What were the main reasons returned to your house or property? Select all that apply.

- To see if my house and property survived
- To check on the safety of other household members
- To check on the safety of pets, animals and livestock
- To protect the house and property from the fire
- To take supplies (food, water, medication etc.) to those who stayed
- To get things I needed (e.g. clothes, medication, pets etc.)
- The threat has passed
- Other (please specify)

76. When returning, did you experience difficulties associated with any of the following? Select all that apply.

- Poor visibility
- Smoke
- Embers
- Flames
- Traffic
- Fallen trees
- Had a car accident
- Official road block
- Other (please specify)
- None of the above
-
-



77. If there was another similar fire in your town or suburb, would you take the same action in leaving?

- Yes
- No

Why/why not? [free text box]

QUESTIONS ABOUT STAYING

[Respondents are directed to this section if they select option 3, 4, 5, 6, 7 or 8 to Q68]

78. Why did you stay with your house or property during the bushfire? Please select all that apply.

- To protect my house and/or property
- To protect livestock or other animals
- I received an official warning via SMS or telephone call advising me to stay
- I received an official warning (other than a SMS or telephone call) advising me to stay
- The fire didn't reach my house or property and I didn't feel it was necessary to leave
- I felt it was too late to leave
- Police, fire or emergency services advised me to stay
- Relatives, friends or neighbours advised me to stay
- My attempts to leave were unsuccessful
- Other (please specify)

79. When staying at your house or property, how confident were you that you...

[Response options are: Very confident; Confident; Not very confident; Not confident at all; not applicable]

- Could do what was required to protect yourself and others?
- Could do what was required to protect your house?
- Could do what was required to protect other structures and assets?



- Could do what was required to protect agricultural assets (such as machinery, sheds, crops and pasture)
- Could do what was required to protect pets, animals and/or livestock
- Would get help from other people? (e.g. neighbours, friends)
- Would get help from fire or emergency services?

80. Did you feel your life was endangered while staying at your house or property?

- Yes
- No

81. Did you experience any difficulties while staying with your house or property? (e.g. lost electricity; suffered smoke inhalation etc.)

- [Free text box]
-

82. What actions did you take to protect the house and/or property? Please select all that apply.

- None
- Preventative wetting down objects
- Extinguish spot fires in vegetation
- Extinguish embers igniting on the house
- Extinguish embers igniting on outbuildings
- Protect the house from direct flame contact or radiant heat
- Extinguish fire on the house arising from direct flame or radiant heat
- Other (please specify)
-
-

83. What equipment did you use while staying at your house or property?

- Dust mask or cloth over mouth and nose
- Gloves
- Garden tools (such as rakes and shovels)
- Ladder
- Tractor
- Long sleeved shirt and pants
- Helmet
- Mobile water supply
- Garden sprinkler
- Bushfire sprinkler system



- Firefighting water pump
- Goggles
- Water from pool, spa, dam or tank
- Firefighting hose/nozzles
- Mops and buckets
- Garden hose
- Wool blanket
- Other (please specify)

84. Did you experience any difficulties while staying with your house or property (e.g. equipment failure, loss of power, suffered smoke inhalation etc.)?

[free text box]

•

85. Did you take shelter at any stage during the fire (for either a short or longer period of time)?

- Yes
- No (Go to Q87)

•

•

86. Where did you take shelter?

- Bathroom
- Other room inside house
- Garage
- Shed or other building
- Basement or cellar
- Bushfire bunker
- Vehicle
- Open area
- Swimming pool
- Water tank
- Other (please specify)

•

87. Did you leave your house or property at any stage during the fire?

- Yes
- No (Go to Q95)

•

•

88. Why did you leave your house or property? Select all that apply.

- I saw/smelled smoke nearby
- I saw flames nearby
- There was fire in the immediate vicinity of my property
- To get things that were needed to defend the property (e.g. petrol pump, generator, petrol etc.)



- To help others defend property
- To go and look at the fire
- To go and fight the fire with the fire brigade
- To go and fight the fire with other landholders or neighbours
- Police, fire or emergency services told me to leave
- Relatives, friends or neighbours told me to leave
- I received an official warning via SMS or telephone call
- I received an official warning (other than a SMS or telephone call)
- I felt it was too dangerous to stay and defend my house and/or property
- I sustained an injury (e.g. smoke inhalation or burns)
- I wanted to remove other household members or visitors from danger
- Utilities (e.g. water, electricity) or equipment (e.g. generators, pumps) failed and I was unable to defend my property without them
- My house caught on fire
- To move/evacuate animals (pets, livestock etc.)
- Other (please specify)
 -
 -

89. When you left, where did you go?

- Another house in my local area (e.g. a neighbour or friend's house)
- Another house further away (e.g. family or friend's house)
- Another building in my local area, such as a community hall or store
- An open area in my local area, such as a paddock, reserve or oval
- A nearby town that was safe from the fire
- An evacuation centre
- A Neighbourhood Safer Place
- Other (please specify)

90. When you left, did you feel that the danger was...?

- Very high
- High
- Moderate
- Low
- Very low



91. When leaving, did you experience any difficulties associated with any of the following? Select all that apply.

- Poor visibility
- Smoke
- Embers
- Flames
- Traffic
- Fallen trees
- Had a car accident
- Official road block
- Other (please specify)
- None of the above
-
-

92. How long were you away from your home?

- Less than an hour
- A few hours
- Overnight
- 1-2 days
- More than two days but less than a week
- A week or more

93. What were the main reasons you returned to your house or property?

Select all that apply.

- To protect the house and property from the fire
- To see if my house and property survived
- To check on the safety of other household members
- To check on the safety of pets, animals and livestock
- To take supplies (food, water, medication etc.) to those who stayed
- To get things I needed (e.g. clothes, medication, pets etc.)
- The threat had passed
- Other (please specify)



94. When returning, did you experience difficulties associated with any of the following? Select all that apply.

- Poor visibility
- Smoke
- Embers
- Flames
- Traffic
- Fallen trees
- Had a car accident
- Official road block
- Other (please specify)
- None of the above

95. If there was another similar fire in your town or suburb, would you take the same action in staying with your home or property?

- Yes
- No

Why/why not? [free text box]

Part 5: How the bushfires affected you and your property

In this section we would like to find out about how the bushfires affected you and your property.

96. Was your house or residence damaged or destroyed by the bushfire?

- No, not damaged
- Yes, minor damage
- Yes, major damage
- Yes, destroyed

97. Were any of the following damaged or destroyed by the bushfire? Please select all that apply.

[Response options: Destroyed; damaged; not damaged; not applicable]

- Vehicle



- Caravan/motorhome
- Water tank
- Pipes or hoses
- Shed
- Garage
- Other outbuildings
- Farm equipment
- Fences
- Pasture
- Crops
- Gardens
- Other (please specify)

98. Were any of your pets, animals or livestock injured or killed by the bushfire?

- No
- Yes (please specify)
 - Animal Types : Total Injured : Total Killed

99. Have any members of your household (including yourself) experienced any of the following as a result of the fires? Please select all that apply.

- A member/s of my household was injured in the fires
- My household has experienced financial strain because of job loss or loss of livelihood
- My household has experienced financial strain due to lack of insurance
- Relationships between members of the household have been more strained than usual because of the fires
- A member of the household has felt more nervous or anxious than usual because of the fires
- A member of the household has felt more sad or depressed than usual because of the fires
- A member of my household has suffered health problems because of the fires



- Other (please specify)
- None of the above
-

100. Please use the box below if you would like to add anything about the effects of the fires on your household.

[Free text box]

LAST PAGE – ALL TO COMPLETE

101. Thank you for completing the survey. Please use the box below if you have any further comments about the bushfires.

[Free text box]