

Bushfire survival preparations by householders in at-risk areas of south-eastern Australia

Dr Jim McLennan, La Trobe University, Glenn Elliott, RMIT, and Lyndsey Wright, Bushfire CRC, describe the continuing generally low levels of bushfire safety planning and preparation by residents of at-risk communities in Australia. [®]

ABSTRACT

While Australian state and territory governments devote considerable resources to combating bushfires, landowners and householders are increasingly expected to take responsibility for protecting their property and for their personal safety. All Australian states and territories have community bushfire safety programs in place which provide information and advice to householders about bushfire survival. This paper describes findings from a 2012 survey of 584 residents in at-risk areas of south-eastern Australia and describes generally low levels of planning and preparation for bushfires. Householder lack of planning and preparation for safe evacuation if threatened was especially concerning¹.

Introduction

Over recent decades bushfires (or wildfires) have proved to be a serious natural hazard threatening communities in many countries (Gill, Stephens & Cary 2013). In Australia, Victoria's 2009 Black Saturday bushfires caused 173 deaths and destroyed more than 2 000 homes. These fires were followed by destructive bushfires in Western Australia in 2011 and 2012, and in Tasmania, NSW, South Australia and Victoria in 2013. There is considerable agreement among bushfire scientists that there will be more frequent serious bushfires in some locations in future, for three reasons:

- climate change is resulting in lower rainfall and higher temperatures in many areas

- more people are choosing to live in areas of high bushfire risk—especially in bushland-urban interfaces, and
- land use and land management policies and practices are changing (Cary *et al.* 2012, Hennesey *et al.* 2006, Liu, Stanturf & Goodrick 2010).

State and territory governments devote considerable resources so fire and land management agencies can combat bushfires. However, there is a general expectation that landowners and householders will have to take greater responsibility for their personal safety and property protection in order to minimise the impacts of future bushfires on communities (Council of Australian Governments 2011, Fire Services Commissioner of Victoria 2012).

Before February 2009 Australian fire agencies advised residents to prepare to stay and defend their homes in the event of bushfire or to leave well before a fire threatened their property:

'...By extinguishing small initial ignitions, people of adequate mental, emotional, and physical fitness, equipped with appropriate skills, and basic resources, can save a building that would otherwise be lost in a fire...People should decide well in advance of a bushfire whether they will stay to defend them or leave if a bushfire threatens.' (Australian Fire Authorities Council 2005, p. 6).

This position came to be summarized as the 'prepare, stay and defend, or leave early' policy (Tibbits *et al.* 2008). The policy was developed following investigations into multi-fatality bushfires in Victoria, South Australia and Tasmania in the period 1967 to 1983. Australian fire agencies concluded that:

- civilians were most likely to die because of either the effects of radiant heat or as a result of a motor vehicle accident while fleeing at the last moment, and
- suitably prepared homes could be defended against bushfires while providing a safe refuge for people during the passage of the main fire front (Tibbits *et al.* 2008).

¹ The present study was part of a larger Bushfire CRC program of community bushfire safety research. Reports of previous study findings are at: www.bushfirecrc.com/category/bushfiretopic/community-safety.

However, following the 2009 Victorian fires, in which 113 people are believed to have died inside their homes (Whittaker *et al.* 2013), the Australasian Fire and Emergency Services Authorities Council revised aspects of its official community bushfire safety position to give more weight to the 'leave early' option:

'People usually have two safe options when threatened by bushfire: leaving early or staying and defending adequately prepared properties. Leaving early is always the safest option' (Australasian Fire and Emergency Services Authorities Council 2010, p. 1).

In all Australian states and territories there are community bushfire safety education, information, and advice programs intended to promote householder bushfire survival planning and preparation. Considerable research (mostly North American) has been published about community safety, much of which investigated determinants of householder intentions to better-prepare their properties to survive wildfire (bushfire) attack (e.g. McCaffrey *et al.* 2013, McFarlane, McGee & Faulkner 2011, Paton, Burgelt & Prior 2008). However, to date, there has been only limited information published about levels of Australian householder planning and preparation for possible bushfires.

Method

The study was part of a larger Bushfire Cooperative Research Centre project investigating householder decision-making under imminent bushfire threat (Bushfire Cooperative Research Centre 2010). Community bushfire safety staff in the ACT Rural Fire Service, the NSW Rural Fire Service, the Tasmania Fire Service, and the Victorian Country Fire Authority were asked to nominate six locations regarded as being notably at-risk of serious bushfire attack and which had not experienced a serious bushfire within the previous 10 years. Each agency was invited to select two locations on the bushland-urban fringes of regional centres or a capital city, two locations where most householders resided in small rural towns, and two locations where most residences had isolated dwellings on farms or other large rural properties².

Information published by the Australian Bureau of Statistics (2011) indicated that there were approximately 28 500 occupied dwellings in the locations proposed. Only a relatively small percentage of those dwellings would be significantly at risk of bushfire because of distance from bushland, house construction and landscaping (Chen & McAneney 2004, Wilson & Ferguson 1986).

Accordingly, a procedure was adopted where householders could participate by completing an online survey or requesting a reply-paid printed questionnaire

from the researchers if they considered that their homes were at risk of bushfire attack. The invitations were issued by several means. Residents of small towns and bushland-urban suburbs were mailed an invitation brochure and posters were displayed in community gathering points such as libraries and community centres. Researchers gave interviews describing the research on local radio stations and wrote news stories for local newspapers. Participants were encouraged to bring the research to the attention of neighbours. Data collection took place between February and May 2012.

Survey questionnaire

A survey instrument was constructed in two formats, online and reply-paid postal questionnaire, with identical substantive content but different instructions for completion. Both versions specified that only one member of a household should take part. The survey asked for basic demographic information and then presented participants with the following scenario and response options:

Now imagine that during the fire season you and all those who normally reside with you are at home. It has been declared a day of 'Extreme Fire Danger', and there is a Total Fire Ban for your Region of the State/Territory. At about 3 pm you become aware of a warning (on the radio, or a web site, or by email, or text, or telephone) that there is a large bushfire burning out of control and that it will probably hit your location in 1–2 hours. You look outside and see a large plume of smoke being blown toward your property.

What do you think you would most likely decide to do?

- a. Leave as soon as you can
- b. Stay to defend the home
- c. Wait and see what develops, before finally deciding whether or not to leave, or to stay and defend.

The questionnaire asked about reasons for making the choice (reported in McLennan, Elliott & Beatson 2012) and then asked householders to complete the Householder Preparations for Bushfires checklist (McLennan & Elliott 2011), specific instructions were:

Below is a list of things that people who live in a place that could be at-risk of bushfire can do to make themselves safer. For each one say whether you or a member of your household has: already done, partially done, definitely will do, intend to do, may do, or will not do, to prepare for a bushfire this fire season.—If an item does not apply (for example, it is about pets or livestock and you not have any, then choose N/A).

McLennan and Elliott (2011) note that there did not appear to be a comprehensive tool readily available for researchers to assess levels of householder preparation for bushfires, and described construction

² Locations ACT: Bonython, Duffy, Fisher, Hackett, Holder, Tharwa, Weston. NSW: Captains Flat, Diggers Camp, Hornsby Heights, Kandos, Leura, Nelson Bay, Walla Walla. Tasmania: Bothwell, Deloraine, Dover, Mount Nelson, New Norfolk, Ouse, Port Sorell/Shearwater. Victoria: Beechworth, Delatite, Warrandyte, West Wodonga, Wonga Park, Yackandandah.



Destruction after the 2009 Victorian bushfires.

of their Householder Preparations for Bushfires research checklist³. The items were based on those proposed by Paton *et al.* (2006) and those used by Whittaker *et al.* (2010) in their postal survey of residents impacted by the 2009 Victorian Black Saturday bushfires. Several draft versions of the checklist were evaluated by an eight-member panel with expertise in bushfire behaviour, house construction, and bushfire safety. The resulting checklist comprised:

- two items concerning household bushfire safety plans, first for a predicted day of severe (or worse) fire danger weather, and second in the event of a bushfire threat warning, and
- 21 preparation activity items covering
 - preparations to leave safely (four items)
 - active house defence (eight items)
 - reducing danger to the house (four items)
 - reducing house vulnerability (five items), and
 - seven items concerning last-minute preparations on a day of severe or worse fire danger (these items were not used in the present study).

³ Subsequently, researchers at the Centre for Environmental Risk Management of Bushfires, University of Wollongong, have independently developed criteria for effective householder defence of a dwelling under bushfire attack (Penman *et al.* 2013).

Results and discussion

Participants

A total of 584 residents of bushfire-prone areas in south-eastern Australia responded to the invitation to take part in the survey. The respondents were 274 men (47 per cent) and 310 women (53 per cent). The mean age of the men was 56.6 years (SD = 13.42), the mean age of the women was 53 years (SD = 13.93). The majority of these householders (46 per cent) described their property as being located on urban-bushland fringes of regional centres or capital cities. A further 34 per cent described their location as a small rural town. The remaining 20 per cent described their location as being an isolated dwelling on a farm or other large rural property. The average length of residence was 16.4 years (SD = 4.8 years) and five per cent of those surveyed had lived in their communities for less than 12 months.

Of the 584 participants, the majority (273, 47 per cent) responded to the bushfire threat scenario by choosing the 'leave as soon as possible' option, 139 (24 per cent) chose the 'stay and defend' option, and 172 (29 per cent) chose the 'wait and see' option. Table 1 shows that householders intending to leave were more likely to reside in an urban-bushland fringe home (48 per cent) and least likely to reside in an isolated rural dwelling (19 per cent). Those intending to stay and

defend were somewhat more likely to reside in a small rural town (37 per cent). Those intending to wait and see were more likely to reside in an urban-bushland fringe home (56 per cent) and least likely to reside in an isolated rural dwelling (13 per cent).

Table 1: Percentage of householders in each intention group residing in an isolated rural dwelling, a small rural town, or an urban-bushland fringe.

Location of Residence	Leave (n = 273)	Stay & Defend (N = 139)	Wait and See (n = 172)
Isolated rural dwelling (n = 117)	19%	31%	13%
Small rural town (n = 196)	33%	37%	31%
Urban-bushland fringe (271)	48%	32%	56%
Total (N = 584)	100%	100%	100%

It should be noted that the sample of householders is unlikely to be truly representative of residents in the communities surveyed in some important respects. Overall, participants were almost certainly more engaged with issues of bushfire threat and safety than many of their neighbours. This is because of the methodology employed in which, unlike a telephone or individually addressed postal questionnaire survey, participating required motivation to actively 'opt-in' to the study by typing or pasting a link into an internet search engine, or telephoning or emailing the researchers to request a questionnaire. A likely consequence of this is that overall levels of bushfire planning and preparation in the communities studied are probably appreciably lower than those described here.

Table 2 shows the percentage of householders in the three intention groups (leave, stay and defend, wait and see) who reported having completed the 21 bushfire safety preparation activities. An exploratory factor analysis of preparation activity item score inter-correlations, followed by an item-homogeneity analysis indicated that the 21-item checklist comprised four subscales as proposed⁴:

- Leave - four items ($\alpha = .61$)
- Active House Defence - eight items ($\alpha = .82$)
- Reduce Danger to House - four items ($\alpha = .79$), and
- Reduce House Vulnerability - five items ($\alpha = .69$).

Bushfire safety planning

Having a bushfire safety plan is considered by fire agencies to be an essential ingredient of householder bushfire safety. Examination of Table 2 indicates rather

low levels of household bushfire safety planning. For those intending to leave, the percentages of households with a bushfire safety plan were 34 per cent for a day of severe weather or worse and 39 per cent for when there was a warning that bushfire was threatening homes. For those who intended to stay and defend the figure was 56 per cent for both situations. For those intending to wait and see what developed the figure was 24 per cent for both situations⁵.

Preparations for active house defence and reducing danger to the house

There is good evidence that houses which are defended against bushfire attack are more likely to survive compared with undefended houses (Blanchi & Leonard 2008). However, in the 2009 Victorian bushfires, 113 of the 173 deaths occurred in houses. In their analysis of transcripts of interviews with residents impacted by the 2009 Victorian Black Saturday bushfires, McLennan, Elliott and Omodei (2012a) proposed a definition of a 'high' level of preparation for staying and defending, based on field observations, analysis of interview transcripts, and expert opinion:

'...vegetation clearing, independent water supply and independent power source; plus two or more of: sprinklers, implements, water containers, protective clothing' (p. 919).

Inspection of Table 2 suggests levels of preparation reported by an appreciable percentage of those intending to stay and defend were probably inadequate for safe defence of a home under severe or extreme fire danger weather conditions. A supplementary analysis showed that 54 per cent of householders who intended to stay and defend property would warrant a 'high' level of preparation rating using the above definition.

Preparations for leaving

Several studies have found that many householders who leave following a bushfire threat warning do so late, potentially under conditions in which lives are in jeopardy (McLennan, Elliott & Omodei 2012b, Tibbits & Whittaker 2007, Whittaker *et al.* 2013). Several reports have documented the dangers associated with late evacuations (Handmer, O'Neill & Killalea 2010, McLennan, Elliott & Omodei 2012b, Proudley 2008, Wilson & Ferguson 1984). An analysis of bushfire fatalities in Australia during the period 1900 to 2008 (Haynes *et al.* 2010) showed that late evacuation was the circumstance most often associated with bushfire deaths, accounting for 32 per cent of all fatalities. McLennan, Elliott and Omodei (2012a) proposed the following definition of a 'high' level of preparation for leaving following a bushfire threat:

'...detailed evacuation plan including three or more of: safety of documents and valuables, arrangements for pets/livestock, destination, evacuation routes, necessities for family needs for 24 hours or more' (p. 919).

⁴ Principal Components Analysis was used, four components with eigenvalues > 1.0 were extracted, Varimax rotation was employed: (1) Active Defence, eigenvalue = 5.90; (2) Reducing Danger to the House, eigenvalue = 1.83; (3) Reducing House Vulnerability, eigenvalue = 1.45; (4) Leaving, eigenvalue = 1.23. All four subscales had Cronbach's alpha (α) reliability values > .6.

⁵ In Table 2, responses have been collapsed to two alternatives, 'completed', 'not completed' (N/A was treated as a missing value). For the factor analysis and item-homogeneity analyses the original six-valued response scales were used, where Already Done = 5 and Will not do = 0.

Table 2: Percentage of householders in each intention group reporting preparatory actions completed.

Preparation Type	Preparation Action	Leave (n = 273)	Stay and Defend (N = 139)	Wait and See (n = 172)
Bushfire Safety Planning:	Prepared a plan involving all members of the household for what to do when a day of severe or worse fire danger weather is forecast or declared for your region	35%	56%	24%
	Prepared a plan involving all members of the household for what to do when there is a warning that there is a bushfire threatening your home	39%	56%	24%
Preparations For Leaving	Planned what to do if you decided to leave your home because of the risk of a bushfire (e.g., where to go and stay; the route to take; what to do about pets/livestock)	52%	62%	41%
	Identified a location nearby where you, or other family members, could shelter safely if you had to leave your home because of a bushfire	61%	74%	61%
	Checked that you have enough home contents and building insurances	87%	89%	86%
	Stored important documents and possessions safely elsewhere, or in a fire-proof location on site, or have them packed ready to take with you when you leave.	40%	38%	37%
Preparations For Active House Defense:	Installed a pump that does not depend on mains electric power (i.e. petrol, diesel-driven or electrically powered by a generator)	20%	59%	19%
	Installed a water tank for firefighting purposes and/or to supply a sprinkler system	32%	68%	30%
	Obtained and prepared firefighting equipment such as ladders, buckets and mops	27%	75%	35%
	Prepared a kit of protective clothing and gear (boots, smoke masks, goggles for members of the household)	21%	63%	22%
	Obtained and prepared hoses long enough to reach all parts of the house	41%	75%	49%
	Installed a sprinkler system on or around the house	8%	34%	14%
	Obtained a battery-powered radio with fresh batteries	53%	76%	51%
Preparations For Reducing Danger to the House:	Installed or constructed a fire shelter or bunker in which to take refuge if necessary	2%	12%	4%
	Removed bushes close to the house and cut back overhanging tree branches	39%	68%	42%
	Cleared leaves, twigs, long grass from around the house to a distance of 20-30 metres	46%	69%	49%
	Moved combustible material such as firewood, garden furniture, lawn mower fuel, paint tins, old cars or tyres away from the house	46%	69%	49%
Preparations For Reducing House Vulnerability:	Used landscaping, tree planting, or the layout of the garden to protect the house from bushfires	29%	59%	39%
	Enclosed under-floor spaces to prevent embers or flames from entering	48%	62%	60%
	Covered gaps and vents to reduce the risk of embers entering the house through openings under the roof or in walls	30%	48%	30%
	Installed seals and/or draft protectors around windows and doors	32%	46%	52%
	Installed roof gutter protection	26%	40%	26%
	Installed shutters for windows	1%	3%	3%

Examination of Table 2 shows a minority of householders intending to leave if threatened (39 per cent) had planned and prepared to leave safely. Overall levels of preparing to leave safely among this group were no greater than those reported by householders intending to stay and defend and those intending to wait and see. A supplementary analysis showed that 30 per cent of those who intended to leave would warrant a 'high' level of preparation rating using the above definition.

It is noteworthy that relatively few of those intending to leave reported undertaking actions to reduce danger to their house or to reduce vulnerability of their house in order to increase the likelihood of the property surviving in their absence. Recent reviews of (mostly) North American research concerning failure of householders to take preparatory wildfire mitigation activities suggests that perceived low probability of their home being threatened by a wildfire is a major determinant (McCaffrey *et al.* 2013, McFarlane, McGee & Faulkner 2011). While many bushfires occur during each fire season few fires result in property loss. Even in high bushfire risk areas the probability that a given house will be seriously threatened by a bushfire during the life of a household is vanishingly small (McAneney, Chan & Pitman, 2009). Fire agencies thus have a difficult task in persuading householders to take precautions against a threat which will never be experienced by most residents.

Interviews conducted by Bushfire CRC research teams with 238 residents affected by January 2013 bushfires in NSW (McLennan, Wright & Mackie. 2013)⁶ suggested that householders who had not planned to stay and defend their property were likely to be relatively less engaged with bushfire safety as an issue. Before the January 2013 bushfires a typical perspective of those residents who had never previously been threatened by a bushfire could perhaps be expressed as 'bushfires happen elsewhere and to other people'. To the extent that potential bushfire threat had ever been considered, most had believed previously that evacuation would be a simple matter in the unlikely event it was ever necessary. Actually being threatened by an imminent bushfire was a frightening, confusing and difficult experience for some. In their community bushfire safety messages to householders fire agencies could perhaps use house and contents insurance as an analogy: few houses catch fire but if they do adequate insurance is a godsend. Likewise, few households are threatened seriously by a bushfire, but if such a threat occurs having planned and prepared for it may prove a lifesaver.

Limitations of space preclude discussion of respondents who chose the 'wait and see' option. To summarise, these householders did not view their waiting as involving additional risk. They were reluctant to commit to a final decision because they feared making the wrong choice: leaving unnecessarily and being exposed to danger on roads and perhaps losing a house which could have been defended safely, or staying and having to survive a worse than expected

bushfire attack. A detailed account of the findings about why householders intend to 'wait and see' following a bushfire warning is in McLennan and Elliott (2013).

Note: the survey was conducted in 2012, following what had been three relatively quiet bushfire seasons in south-eastern Australia. The calendar year 2013 was the worst in the region since 2009, with scores of houses destroyed in New South Wales, South Australia, Tasmania and Victoria. It remains to be seen whether these bushfire events have led to higher levels of householder preparation for possible future bushfire threats.

Acknowledgements

The research was funded by a Bushfire Cooperative Research Centre (CRC) Extension Grant. The views expressed here are those of the authors and do not necessarily represent the views of the Bushfire CRC Board. We are grateful for the assistance provided by Andrew Stark and Rohan Samara (ACT Rural Fire Service), Tanyia Tuckey and Ruby Gamble (NSW Rural Fire Service), Damien Killalea (Tasmania Fire Service), Max Garner (North Warrandyte Community Fireguard), and Heidi Cochrane (La Trobe University School of Psychological Science, Albury-Wodonga campus) in carrying out the survey.

References

- Australian Bureau of Statistics 2011, *Community profiles*. Canberra: ABS. At: www.abs.gov.au/websitedbs/censushome.nsf/home/communityprofiles.
- Australian Fire Authorities Council 2005, *Position paper on bushfires and community safety*. (AFAC: East Melbourne). T: www.royalcommission.vic.gov.au/Documents/Document-files/Exhibits/TEN-001-001-0077.
- Australasian Fire and Emergency Services Authorities Council 2010, *Bushfires and community safety: position; version 4.1*. East Melbourne: AFAC. At: http://knowledgeweb.afac.com.au/positions/documents/AFAC_Position_Bushfires_Community_Safety_v4.1.pdf.
- Blanchi, R & Leonard. J 2008, *Property safety: Judging structural safety*. In: J Handmer & K Haynes (Eds.). *Community bushfire safety* pp. 77-85. Melbourne: CSIRO Publishing.
- Bushfire Cooperative Research Centre 2010, *Bushfire CRC – Communicating risk*. Melbourne: Bushfire CRC. At: www.bushfirecrc.com/research/program-2.
- Cary, GJ, Collett, G, Gill, MA, Clayton, H & Dovers, S 2012, *Future scenarios and Australian bushfires: Report on a Bushfire CRC workshop*. The Australian Journal of Emergency Management, Vol. 27, No. 3, pp. 34-40.
- Chen, K & McAneney, J 2004, *Quantifying bushfire penetration into urban areas in Australia*. *Geophysical Research Letters*, Vol. 1, No. 12, L12212. doi:10.1029/2004GL020244.
- Council of Australian Governments 2011, *National Strategy for Disaster Resilience*. Canberra: COAG. At: www.coag.gov.au/sites/default/files/national_strategy_disaster_resilience.pdf.
- Fire Services Commissioner of Victoria 2012, *Bushfire safety policy framework*. Melbourne: FSCV. At: www.firecommissioner.vic.gov.au/wp-content/uploads/Bushfire_Safety_2012.pdf.

⁶ The 238 interviews were conducted with residents of bushfire affected areas near Coonabarabran (n = 83), Shoalhaven (n = 75), and Yass (n = 80), NSW.

- Gill, AM & Stephens, SL 2009, *Scientific and social challenges for the management of fire-prone wildland-urban interfaces*. *Environmental Research Letters*, Vol. 4: 034014. doi:10.1088/1748-9326/4/3/034014.
- Gill, AM, Stephens, SL & Cary, GJ 2013, *The worldwide "wildfire" problem*. *Ecological Applications*, Vol. 23, pp. 438-454. doi.org/10.1890/10-2213.1.
- Handmer, J, O'Neil, S & Killalea, D 2010, *Review of fatalities in the February 7, 2009, bushfires*. Melbourne: Centre For Risk and Community Safety RMIT University and Bushfire CRC: Melbourne. At: www.bushfirecrc.com/managed/resource/review-fatalities-february-7.pdf.
- Haynes, K, Handmer, J, McAneney, J, Tibbits, A & Coates, L 2010, *Australian bushfire fatalities 1900-2008: Exploring trends in relation to the 'Prepare, stay and defend or leave early' policy*. *Environmental Science & Policy*, Vol. 13, pp. 185-194. doi: 10.1016/j.envsci.2010.03.002.
- Hennessy, K, Lucas, C, Nicholls, N, Bathols, J, Suppiah, R & Ricketts, J 2006, *Climate change impacts on fire-weather in south-east Australia*. *Aspenvale Victoria: CSIRO*. At: http://laptop.deh.gov.au/soe/2006/publications/drs/pubs/334/ld/ld_24_climate_change_impacts_on_fire_weather.pdf.
- Liu, Y, Stanturf, J & Goodrick, S 2010, *Trends in global wildfire potential in a changing climate*. *Forest Ecology and Management*, Vol. 259, pp. 685-697. doi.org/10.1016/j.foreco.2009.09.002.
- McAneney, J, Chen, K, & Pitman, A 2009, *100-years of Australian bushfire property losses: Is the risk significant and is it increasing?*. *Journal of Environmental Management*, Vol. 90, pp. 2819-2822. doi: 10.1016/j.jenvman.2009.03.013.
- McCaffrey, S, Toman, E, Stidham, M & Shindler, B 2013, *Social science research related to wildfire management: An overview of recent findings and future research needs*. *International Journal of Wildland Fire*, Vol. 22, pp. 15-24. doi: 10.1071/WF11115.
- McFarlane, BL, McGee, TK & Faulkner, H 2011, *Complexity of homeowner wildfire risk mitigation: an integration of hazard theories*. *International Journal of Wildland Fire*, Vol. 20, pp. 921-931. doi: 10.1071/WF10096.
- McLennan, J & Elliott, G. 2011, *Checklist items for researchers: Householder preparations for bushfires*. Melbourne: School of Psychological Science La Trobe University and Bushfire CRC. At: www.bushfirecrc.com/managed/resource/checklist_items_for_researchers_occasional_report_2011.pdf.
- McLennan, J & Elliott, G 2013, 'Wait and see': the elephant in the community bushfire safety room? In R. P. Thornton & L. J. Wright (Eds.), *Proceedings of Bushfire CRC & AFAC 2012 Conference Research Forum 28 August 2012 Perth Convention and Exhibition Centre* (pp. 56-69). East Melbourne: Bushfire CRC. At: www.bushfirecrc.com/sites/default/files/managed/resource/final_mclennan_j.pdf.
- McLennan, J, Elliott, G & Beatson, R 2012, *Householders' stated bushfire survival intentions under hypothetical threat: Factors associated with choosing to leave, or stay and defend, or wait and see*. Melbourne: School of Psychological Science La Trobe University and Bushfire Cooperative Research Centre. At: <http://bushfirecrc.com/publications>.
- McLennan, J, Elliott, G & Omodei, M 2012a, *Householder decision making under imminent wildfire threat: stay and defend or leave?* *International Journal of Wildland Fire*, Vol. 21, pp. 915-925. doi: 10.1071/WF1106.
- McLennan, J, Elliott, G & Omodei, M 2012b, *Issues in community bushfire safety: Analyses of interviews conducted by the 2009 Victorian bushfires research task force*. Melbourne: School of Psychological Science La Trobe University and Bushfire Cooperative Research Centre. At: www.bushfirecrc.com/sites/default/files/managed/resource/issues_in_community_bushfire_safety-analyses_of_interviews_conducted_by_the_2009_victorian_bushfires_research_task_force.pdf.
- McLennan, J, Wright, L & Mackie, B 2013, *Community understanding and awareness of bushfire safety: January 2013 NSW bushfires*. Melbourne: School of Psychological Science La Trobe University and Bushfire Cooperative Research Centre. At: <http://bushfirecrc.com/publications>.
- Paton, D, Burgelt, P & Prior, T 2008, *Living with bushfire risk: Social and environmental influences on preparedness*. *The Australian Journal of Emergency Management*, Vol 23, No. 3, pp. 41-48.
- Paton, D, Kelly, G, Burgelt, P & Doherty, M 2006, *Preparing for bushfires: Understanding intentions*. *Disaster Prevention and Management*, Vol. 15, pp. 566-575.
- Penman, TD, Eriksen, C, Bianchi, R, Chladil, M, Gill, AM, Haynes, K, Leonard, J, McLennan, J & Bradstock, RA 2013, *Defining adequate means of wildfire preparation for property protection*. Centre for Environmental Risk Management of Bushfires. University of Wollongong (under review).
- Proudley, M 2008, *Fire, families and decisions*. *The Australian Journal of Emergency Management*, Vol. 23, No. 1, pp. 37-43.
- Tibbits, A, Handmer, J, Haynes, K, Lowe, T & Whittaker, J 2008, *Prepare, stay and defend or leave early*. In J. Handmer & K. Haynes (Eds). *Community bushfire safety* (pp. 59-71). Melbourne: CSIRO Publishing.
- Tibbits, A & Whittaker, J 2007, *Stay and defend or leave early: Policy, problems and experiences during the 2003 Victorian bushfires*. *Environmental Hazards*, Vol. 7, pp. 283-290.
- Whittaker, J, Haynes, K, Handmer, J & McLennan, J 2013, *Community safety during the 2009 Australian 'Black Saturday' bushfires: an analysis of household preparedness and response*. *International Journal of Wildland Fire* (published online). doi: 10.1071/WF12010.
- Whittaker, J, Haynes, K, McLennan, J, Handmer, J & Towers B 2010, *Victorian 2009 bushfire research response: Household mail survey*. Melbourne: Bushfire Cooperative Research Centre. At: www.bushfirecrc.com/research/vicfires-taskforce/Victorian-fires-mail-survey.
- Wilson, AAG. & Ferguson, IS 1986, *Predicting the probability of house survival during bushfires*. *Journal of Environmental Management*, Vol. 23, pp. 259-270.
- Wilson, AAG & Ferguson, IS 1984, *Fight or flee? A case study of the Mount Macedon bushfire*. *Australian Forestry*, Vol. 47, pp. 230-236.

About the authors

Dr Jim McLennan is an adjunct professor in the School of Psychological Science at La Trobe University. He was Research Leader for a Bushfire CRC project investigating householder behaviour during bushfires. Contact: j.mclennan@latrobe.edu.au.

Glenn Elliott is a research officer at the Centre for Sustainable Organisations and Work, Royal Melbourne Institute of Technology (RMIT). He was previously in the School of Psychological Science at La Trobe University working on Bushfire CRC projects.

Lyndsey Wright is research manager at the Bushfire Cooperative Research Centre.