

Leave or Stay Decision Making

Introduction

A central element of household bushfire survival plans in bushfire-prone areas is the decision to either evacuate early before a bushfire arrives, or to stay and defend the property.

There is no doubt that the safest option for households is to evacuate early when possible (i.e. to leave one or more days before a major bushfire arrives). This has been demonstrated by multiple previous bushfire studies and inquiries.

There is always the risk of death or serious injury if householders choose to stay and defend and many people have died as a result of not evacuating early.

In addition, as exemplified by the Black Summer Bushfires of 2019/2020, bushfires are becoming more frequent and increasingly intense as a result of many factors including global heating.

Previous research also shows that houses impacted by bushfires stand a significantly higher chance of surviving if defended by well-prepared residents.

But being 'well-prepared' is not easy and many issues need to be addressed. Just some of these issues include: that the property is truly 'defendable' (e.g. built to bushfire-resilience standards of the current National Construction Code, and that vegetation and other flammable hazards have been eliminated around the property), and that defenders have sufficient physical and mental strength and stamina to withstand extreme challenges that they may be forced to face (e.g. extreme temperatures for long periods).

Whether planning to evacuate, or to stay and defend, careful and detailed planning is extremely important. Bushfires can occur with little warning, and escape routes can

become blocked. Bushfire survival plans with multiple contingencies can be more resilient to such unexpected complications during bushfires.



Pyrocumulonimbus cloud looms over Kangaroo Valley 4th January 2020 (photo – Maureen Bell).

This *Bushfire Research Brief* focuses on how residents in Kangaroo Valley, NSW prepared to leave before potential bushfires or to stay and defend their properties, and how this preparation influenced their actions. It is one of several *Bushfire Research Briefs* that

summarise research findings by the University of Wollongong (UOW) on the Kangaroo Valley community's preparations and responses to, and recovery from, the impact of the Currowan Fire in January 2020.

Three stages of preparation

The timing of preparation and planning for bushfire can be divided into three stages.

Stage 1. Early preparation conducted when there is no specific bushfire threat.

Stage 2. Preparation in response to a heightened level of danger, such as during a particularly dry summer, or when bushfires are burning in neighbouring regions.

Stage 3. 'Last-minute' preparation in response to an approaching bushfire.

All of the 33 households that were interviewed as participants in this Kangaroo Valley case study had established some form of bushfire survival plan during Stage 1, prior to the Currowan Fire. However, the level of detail in these plans varied widely, from somewhat vague intentions that were not written down through to thoroughly documented plans including multiple contingencies to address a range of different scenarios.

"[a local RFS member] ... gave us an example of their fire plan, which was ... holy moly. Like ours was literally four words per column, and theirs was like five pages or something like that, or four pages of really detailed stuff on all these different scenarios. And we've got that at the fire meeting, and that made us go, "Okay, we haven't talked about this. We thought we had.""

The majority of preparation by households in Kangaroo Valley appeared to occur during Stage 2, as residents ramped up their preparations in response to the severe

drought conditions and extensive bushfires burning in Australia from September 2019. By the time the Currowan Fire was approaching (Stage 3), all residents in the study had enacted their plans.

"So yeah, the fire plan, when we sat down and we really, really went through it, that made me feel a lot better, because it just ripped away all those decisions that you'd suddenly have to make at the time, and we'd made them in advance."

But bushfires can arrive with much less forewarning than was the case with the Currowan Fire's impact on Kangaroo Valley. There is not always much opportunity to prepare in Stage 2. To most effectively manage the risk of bushfire, the majority of action should be taken in Stage 1, before the risk level becomes high.

Some of the interviewees in this study expressed the strong view that prior to the fire many people did not know what it really meant to stay and defend a home.

"I think a lot of people don't really know what being prepared means and they don't really know what a defensible house is. I think that's a dangerous gap in people's knowledge. People don't really know what it means to have a defensible house and to be prepared yourself. I don't think we were going to stay anyway. I think we just thought it's not worth losing your life through it. So we decided to leave."

How plans translated into actions

As shown in Figure 1, the majority (55%) of households interviewed had bushfire survival plans that included the intention to evacuate early before the arrival of a future bushfire. All these households did evacuate in the lead up to the Currowan Fire, typically

¹ The blue 'breakout boxes' in this document contain direct quotes from Kangaroo Valley residents who kindly agreed to be interviewed'.

leaving some days before it arrived in Kangaroo Valley.

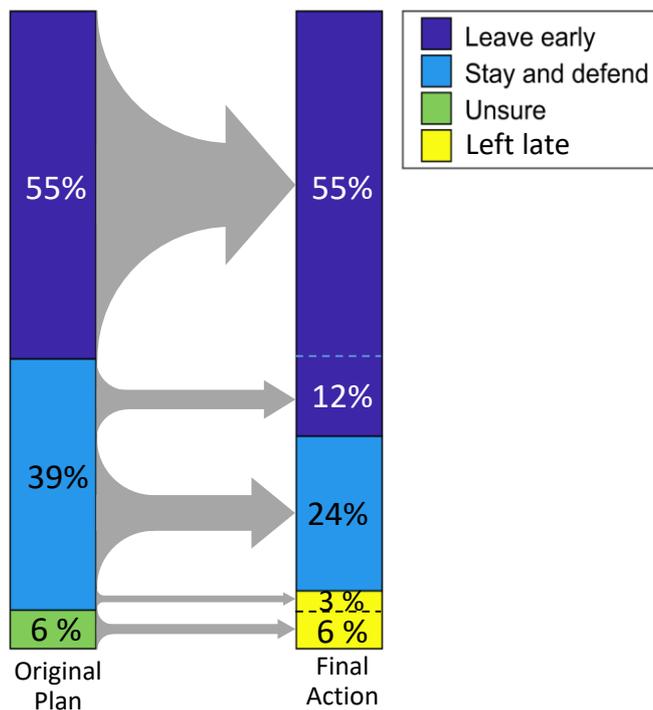


Figure 1. Comparison of household intentions in interviewees' bushfire survival plans compared with the actions taken by them immediately prior to the impact of the Currowan Fire.

"... so I did think, initially, that we could possibly stay and defend, and I had a plan of how I was going to do it. But it was mostly in my head, I've got to say. ... But no, this time we had decided that we were going to leave early. And that was the plan. And then we did. We acted on that. And we left, easily two days before the threat. A lot of other people left it until the last minute, but we left really quite early, and made sure that we were out of the way."

"I didn't have an articulated trigger, I just knew I was not going to try and go the night before or... It was just going to be early, early."

A smaller proportion of interviewees (39% of all interviewees) had planned to stay and defend their properties in the event of a bushfire. However, some of this 'stay and defend' sub-group changed their plan in the weeks preceding the Currowan bushfire and eventually evacuated early, because they perceived that conditions were

abnormally severe and decided that staying would be too dangerous (i.e. 12% of all households interviewed).

"... I mean, we always thought we'd stay and defend. ... [but] the night before the fire we thought, I don't know, I think this is a bit bigger than us actually. And everybody had got out. The RFS had come to see us and told us that there would be no protection for us at all because we're on a forest road, which we always knew. And that we were on our own if we wanted to stay. So actually, everybody in the area cleared out except for three people. And yeah, so we joined the exodus on the night before the fires."

One additional household planned to stay and defend but ended up evacuating late, under extremely challenging circumstances.

The remaining households in the original 'stay and defend' sub-group did not alter their plans, and stayed to defend their properties (i.e. 24% of all households interviewed).

Several households interviewed in the study (6%) had plans that kept both options open. These residents all ended up evacuating within several hours of the Currowan Fire's arrival. Previous research shows that this strategy of leaving late is very risky.

In the days prior to the impact of the Currowan Fire on Kangaroo Valley on January 4th, 2020, coordinators of the Bushfire-ready Neighbourhood Groups network collected valuable information on the intentions of individual households across Kangaroo Valley, which were then passed to the local Rural Fire Service (RFS) brigade. The data collected at this time aligned closely with that gleaned from the interviewees in our research project, as shown in Figure 2.

It should also be noted that there were a number of people in Kangaroo Valley for whom evacuation was not seen as a feasible option. This is exemplified by Dairy Farmers and other businesses with large numbers of

stock that could not practically be transported elsewhere.

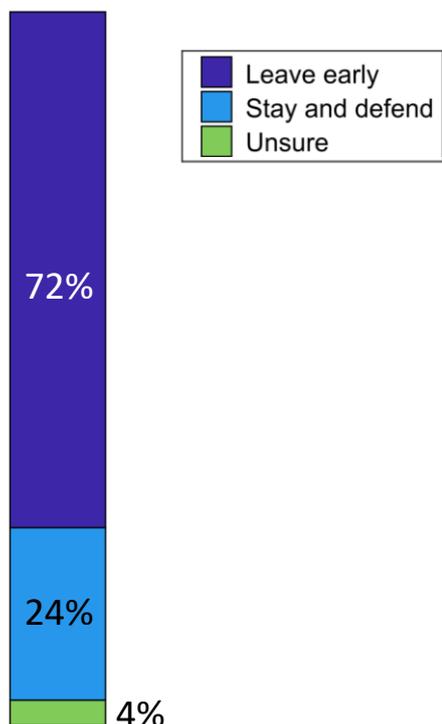


Figure 2. Intentions of households across Kangaroo Valley as collected by coordinators of the Bushfire-ready Neighbourhood Groups immediately prior to the impact of the Currowan Fire. Note that ‘Stay and defend’ includes those households in which at least one member stayed.

Where to evacuate to - places and issues

An important aspect of people’s action in terms of evacuating was where they went on leaving their home. Of the households

interviewed, 73% either stayed with friends and family in other areas of Southern NSW outside Kangaroo Valley or travelled to Sydney. Twenty-six per cent stayed in Kangaroo Valley. Of those: one household sheltered at the Kangaroo Valley Showground, which was a designated Neighbourhood Safer Place (NSP); one sheltered with a neighbour who had decided to stay and defend; one was forced to evacuate their own property at the last minute, under terrifying conditions, and sheltered in town.

Another important issue is when only a fraction of a household evacuates. Such decisions are often fraught with difficulty, with the personal safety and capability of those choosing to stay being important considerations.

Anecdotal information indicated that relatively few people may have used the Kangaroo Valley Showground as a temporary refuge on the night that the Currowan Fire impacted the Valley. However, from our interviews there was evidence that some people were confused as to the availability and facilities that would be at the Showground; and whether they should evacuate to the Showground, or go to another designated NSP or evacuation centre.



Kangaroo Valley Showground – only local designated Neighbourhood Safer Place at the time of the Currowan Fire (photo – Paul Cooper).

“So, my plan was to get out early and I made sure I knew where refuges were. And that, I’ve got to say, isn’t the clearest thing. I was told various things. ... And I didn’t find where you could go, online, to find a definitive answer for that. So, that’s something I think that really isn’t the best, but there you go.”

A review of policies and practices relating to Neighbourhood Safer Places could help address such issues. Such a review should include consideration of how to provide clear messaging to the community on the facilities and access protocols applying to specific Neighbourhood Safer Places and evacuation centres prior to the next emergency situation.

Another concern raised in the course of our research was regarding the organisation of appropriate evacuations for particularly vulnerable people well before the arrival of a bushfire or other emergency. A review by appropriate authorities and community organisations of the arrangements and protocols currently in place would be helpful.

Preparing to leave early

Residents interviewed in this study who planned to evacuate early did so very effectively. However, they reported several common challenges.

1. Inconvenience, disruption and stress caused by false alarms, when they believed the fire would hit days before it actually did, and so either evacuated multiple times, or on just one occasion but very early.
2. Challenges in finding temporary accommodation, including for pets and livestock, or a perception that they were inconveniencing friends and relatives who took them in.
3. The inability to activate bushfire sprinklers or fill gutters with water immediately prior to the fire’s arrival when they evacuated a day or more beforehand.

In retrospect, many residents also believed they should have taken more items of personal value with them when evacuating, or should have stored more items in safer places. Although evacuating under relatively calm conditions several days before the fire arrived, these residents were coping with high temperature days and experiencing high levels of stress and anxiety. They reported finding the task of choosing what to take and/or store safely at such short notice very difficult.

Most residents interviewed who planned to evacuate early before the Currowan Fire did not have, or were not able to have, a ‘Plan B’ in terms of one or more alternative places of refuge or escape routes. However, the geography and roads of Kangaroo Valley, mean that many residents realistically only had one escape route available.

Preparing to stay and defend

All the interviewed residents who stayed to defend their properties believed they were well prepared to do so, although many had misgivings immediately prior to and during the event.

“The thing that probably scared us – well, there was a point there when we saw [the fire] coming. I did check with [my partner]. I said, “This is it and it’s worse than I have told you about. Our last chance to get out” and she said, “No, we’ve made the preparations, let’s stay”. To be honest I was so thankful she said that because if we’d left, it would have been that last minute poor decision, get out, run for your life thing, which is not a thing either of us had wanted to do.”

Several check-lists have been developed by researchers and emergency services, which summarise the detailed and extensive preparation that should be undertaken well in advance of staying to defend a house

from bushfire. One of these check-lists² was used in this study as a tool to assess how prepared Kangaroo Valley residents were.

Based on this check-list, the interviewed residents who defended their properties were found to be well prepared to do so, meeting 80-90% of the items on the check-list. Elements of their preparation included:

- Organisation and planning within the team of people intending to defend the property;
- Use of personal protective equipment;
- Getting fire-fighting equipment ready;
- Storing water on site for firefighting and drinking; and
- Addressing vulnerabilities of the property and buildings to be defended.



Personal protective equipment (PPE) assembled by residents preparing to stay and defend (photo – Paul Cooper).

Several criteria were not met by many households, including:

- Installation of gutter protection (e.g. gutter-guard mesh);
- Removal of tree branches below 2 m;
- Enclosure of all underfloor spaces;

- Storage of all flammable liquids away from the house; and
- Removal of all animals and livestock from the property.

However, none of the residents reported problems having been caused directly by not addressing the items above.

The great majority of interviewed residents who stayed to defend reported that they would likely choose to do so again given their experiences during the Currowan Fire.

Nevertheless, even well prepared residents, some with extensive previous bushfire experience, were surprised at the ferocity of the fire the challenges it presented for them as exemplified by the quotes below.

“But I would say this about the fire: In all my years I’ve never seen anything like that. It took me by surprise. I actually thought to myself in private, as that thing came up the way, this could be one of the worst decisions I’ve ever made in my life. I’m not even entirely sure that we’re coming out the other side of this one. That wasn’t said lightly.”

“I’m not a religious person, but I certainly thought of a few religious lines while it was happening, not wanting to be there and to deal with it. But I was there, and I was fit. I had plenty of water, I was well hydrated. I had things reasonably well set up. But I must admit, I started taking my computer and hard drives down to the wine cellar because I wasn’t sure how bad it was going to get. Because it looked like it was going to be a monster.”

“There was only one stage when it was in the middle of this fire storm, the fire front, I thought, oh, maybe we made a bad decision here.”

Some who stayed and defended subsequently experienced long-term

² *Defining adequate means of residents to prepare property for protection from wildfire*, by Penman, Eriksen, Bianchi, Chladil, Gill, Haynes, Leonard, McLennan, and Bradstock, [International Journal of Disaster Risk Reduction](#), 2013.

impacts on their mental health and wellbeing. This emphasises the need to consider not only physical capacity and preparedness when deciding whether to stay and defend, but also mental capacity to endure potentially traumatic experiences.³

Sources of advice and influence

As we have noted in our *Bushfire Research Brief* 'Community Connections', information shared via the RFS, members of the local Brigade, and by community-based networks was reported as being extremely important to our interviewees.

RFS volunteers met with neighbourhood groups and with individual households in the weeks and days leading up to the impact of the Currowan Fire - stressing that the expected fire would be of extreme intensity, would require significant physical and mental capacity to fight, and would mean that many properties were simply not defensible. This led several participants who had been considering staying and defending to decide that their safest option was to leave, and those staying to intensify their preparation efforts.

"That meeting, [my partner] and I said it I don't know how many times, that meeting saved countless lives, in our opinion. [a local RFS member] went through what to expect for the fire, how horrifying the experience would be, how difficult it would be for someone to defend their property unless they were completely fully resourced and had everything in their favour, and even then they may not be able to. He went through the ferocity of the fire, that it could be 1,000 degrees Celsius, that it would be pitch black like night, that the roar of the fire and the wind would be so extreme you won't be able to hear each other communicate, hence why you need to have everything written down and rehearsed."

A vitally important community meeting was organised by the RFS and held at the Kangaroo Valley Village Hall on the 28th December 2019 where the RFS Incident Controller and other RFS personnel gave a frank assessment of the very high level of bushfire-risk facing the community.



Hundreds of residents cram into the Kangaroo Valley Village Hall (many others could not get in and stood outside) for the public meeting, seen here being addressed by the RFS incident controller 28th December 2019 (photo - Paul Cooper).

³ *Defining the importance of mental preparedness for risk communication and residents well-prepared for wildfire*, by Eriksen and Prior, [International Journal of Disaster Risk Reduction](#), 2013.

This meeting undoubtedly increased the awareness of a great many individuals of the impending danger, which would have led to improved decision making by many households. Information gained at the meeting was also shared with neighbours and other community members.

"I guess that [community] meeting for me personally, I started thinking about a lot of things, and I am no hero, and I have no intention of dying to protect a building. I just think no. I'm not dying that way to protect a building. ... But that first meeting, even at the time you're thinking, "Gee, it's dry, but is it that bad?" And then you went, "Yeah, this is that bad. This is where we're vulnerable." Small town, no way out, and lots of beautiful timber, heritage buildings, and lots and lots of bush. So yeah, it definitely got me thinking. Definitely got me scared."

A small number of interviewees also described how they increased their mental preparation for staying and defending by ensuring they understood likely conditions through activities including researching the internet, watching video footage of previous fires, and by frequently rehearsing their bushfire plans. Reading detailed literature on household preparation and preparation of property and buildings was also extremely important. Several interviewees also mentioned the usefulness of Joan Webster's books on bushfire safety.

Opportunities to better prepare for future bushfires

Experiences and events in Kangaroo Valley indicate that there are multiple opportunities for residents and communities to better prepare for bushfires in the future.

1. Clear communication and comprehension of advice from emergency management authorities is key to households safely responding to the threat of bushfire. Evacuating early is the safest option.
2. Active networks of Bushfire-ready Neighbourhood Groups that have good links with the local volunteer rural fire brigade and other groups, and which form a conduit for information to all members of a community, has been shown to be very beneficial.
3. Residents who thoroughly prepare well before a specific bushfire threat emerges, are more likely to be both physically and mentally prepared, avoiding last minute risky decisions and actions – especially for bushfires that arrive with little forewarning.
4. 'Research and Rehearse' activities are beneficial, including the following.
 - a. Raising knowledge levels of households and the wider community as to what it would be like to experience intense bushfire conditions, including watching video footage of previous major fires, for example.
 - b. Reading and acting upon guidance on preparation for evacuation and the challenges of defending.
 - c. Rehearsing bushfire survival plans well in advance.
5. Deciding whether all members of a household will evacuate or stay to defend well in advance of any bushfire can help avoid late evacuations, which can be very risky.
6. Bushfire survival plans should preferably include multiple options and contingencies for various eventualities; in case escape routes become blocked, for example.
7. Ideally, bushfire survival plans should include detailed lists of items to store safely or to take from the property before bushfires arrive. This will help residents make quick decisions under pressure and avoid forgetting important items. Photos of the house, property, and possessions taken well before a fire arrives will represent

important evidence should the household have to navigate the insurance claims system.

8. Reliable technologies to automatically or remotely activate sprinkler systems immediately before bushfires arrive at a property would be of great assistance to some residents who wish to evacuate early.
9. Ensuring that the community is provided with clear and timely information on evacuation centres and Neighbourhood Safer Places, e.g. their locations, when they can be used, what facilities will be available, whether animals and/or stock can be accommodated, etc, will assist household decision-making.

ADDITIONAL RESOURCES

- *Bushfire best practice guide*, CSIRO, <https://research.csiro.au/bushfire/>

- *Essential bushfire safety tips*, by Joan Webster [3rd edition](#) (Melliodora Publishing, 2021).
- *The complete bushfire safety book*, Joan Webster (Random House 2000).
- *Retrofit your home for better bushfire protection*, released by VBA and CFA, www.docplayer.net/176802-A-guide-to-retrofit-your-home-for-better-protection-from-a-bushfire.html.
- www.rfs.nsw.gov.au/plan-and-prepare/prepare-your-property.
- *The RFS Household Assessment on-line tool* <https://assessmyrisk.rfs.nsw.gov.au/>
- The Australian Institute for Disaster Resilience (AIDR) YouTube page has a range of informative videos, e.g. [What is Disaster Recovery](#) and [Mental Health Recovery After Disaster](#).
- After The Disaster: ABC Radio Podcast <https://www.abc.net.au/radio/programs/after-the-disaster/>

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If this document has raised challenging issues for you, Lifeline Australia provides crisis support 24 hours a day: call 13 11 14 or see <https://www.lifeline.org.au>

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