



Use of Informal Places of Shelter and Last Resort on 7 February 2009

**Peoples' Observations and Experiences – Marysville,
Kinglake, Kinglake West, and Callignee**



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Executive summary

1. Following publication of the 2009 Victorian Bushfires Royal Commission Interim Report, the Bushfire CRC was contracted by CFA, to examine the evidence available from the 7 February fires about human behaviour and fire behaviour potentially related to future designated Neighbourhood Safer Places (or places of last resort); with a particular focus on events that had occurred on 7 February when people had used unofficial places of last resort shelter, notably Gallipoli Park oval, Marysville, and the Kinglake CFA fire station shed.
2. The following sources were utilised: (a) transcripts of interviews with survivors conducted by Bushfire CRC Research Taskforce interviewers; (b) transcripts of evidence presented to the 2009 Victorian Bushfires Royal Commission; (c) post-7 February on-line news accounts of survivors' experiences; (d) books describing survivors' experiences; (e) two pieces of video footage in the public domain showing events at Gallipoli Park oval at Marysville and in the Kinglake town centre; (f) discussion with Bushfire CRC Research Taskforce interviewers; (g) two follow-up telephone interviews with (i) a survivor who sheltered on the Kinglake West oval, and (ii) with a CFA Captain who escorted survivors from the Callignee Oval to safety; and (h) the Final Report of the Bushfire CRC Research Taskforce.
3. Many people survived hazardous conditions on 7 February by sheltering **in vehicles** on large cleared areas such as ovals. It is likely that individuals sheltering in the open, outside vehicles and otherwise unprotected on such areas may have perished or sustained injuries due to embers (some in the form of large solid objects) and/or radiant heat.
4. On each of the four open areas studied (Gallipoli Park oval, Marysville; Kinglake West oval; Kinglake Central Memorial Park oval; Callignee oval), there were relatively small numbers of vehicles present (5–40).
5. While emergency services personnel were present at Gallipoli Park as part of their operational plan to fall back to a safer location if at risk of being entrapped, there was no active defence of civilian vehicles during the passage of the main fire. Emergency services personnel provided material and emotional care and comfort to civilians in need after the passage of the fire. There were no emergency services personnel or equipment on the three other open-area locations studied. A civilian provided water-spray protection for about 25 vehicles on Kinglake West oval.
6. Qualitative interview accounts given by survivors and witness statements to the Bushfires Royal Commission indicate that Gallipoli Park oval was understood by many Marysville residents to be an 'official' place of refuge or assembly. Two survivors stated that Kinglake West oval was understood by some local residents as being a designated place of assembly in the event of fire. Based on the interview transcripts, it seems likely that Kinglake Central Memorial Reserve oval and Callignee oval were simply known by some residents to be large cleared areas that might serve as unofficial places of relative safety as a last resort or at the last minute in the event of a dangerous bushfire.

7. It should be noted that it is unlikely that any of the four ovals in question (Gallipoli Park, Marysville; Kinglake West; Kinglake Central; Callignee) would have complied with the current standards for open areas as designated Neighbourhood Safer Places.
8. Many people survived hazardous conditions on 7 February by sheltering in CFA fire station sheds at Kinglake, Kinglake West, and Marysville. Based on their accounts, it seems likely that if these people had not been able to take refuge in the sheds, then at least some may have perished or at least sustained serious injury from radiant heat and/or embers – some in quite large and solid form. The Kinglake CFA shed was actively defended. The Kinglake West CFA shed does not appear to have been impacted by the fire, though CFA personnel and equipment were on hand to provide defence if needed. The Marysville shed was not defended, and though impacted by heat and embers, it does not appear to have sustained significant damage.
9. There was no evidence from the interviews, or from Bushfires Royal Commission witness accounts, that residents planned to use the CFA fire sheds at Kinglake and Kinglake West as places of refuge prior to Saturday, 7 February. It appears that with no option for safe late evacuation as the fire approached, many people simply ‘ended up’ there because they did not know of any likely safer alternative. This raises questions about the possible role of CFA fire sheds as places of last resort shelter in catastrophic bushfire threat conditions in future. [Almost all those who sheltered in the Marysville CFA shed were CFA personnel.]
10. Interviews with survivors showed that very few of those civilians who sought refuge on ovals, or in and around CFA fire sheds, had prepared for taking shelter in any way: none of those interviewed had supplied themselves with food or water, or spare clothing. Most spent a considerable time at the place of shelter: at least 3 and up to 14 hours before they were able to leave, mainly because of continuing risk of fire and blocked or otherwise unsafe road conditions. This suggests a possible need for greater community education about preparation for safe car travel during the bushfire season.

Introduction

In the aftermath of the 7 February 2009 ‘Black Saturday’ fires in Victoria, and following considerable discussion in the course of the first block of the 2009 Victorian Bushfires Royal Commission hearings (11 May–6 July 2009) concerning bushfire refuges, the Victorian Government made a submission to the Royal Commission proposing, *inter alia*, that the State establish a Neighbourhood Safer Places program so as to provide ‘...a space which is a place of last resort for individuals to access and remain in during the passage of fire through a neighbourhood, without the need to take a high risk journey. They are intended to be places of relative safety...’¹. In its Interim Report², the Royal Commission made seven recommendations concerning neighbourhood safer places:

- 8.3 The CFA give priority where possible to provide resources to assist in the defence of designated community fire refuges and neighbourhood safer places at times when they are likely to be in use.
- 8.5 The State promulgate criteria for the identification and operation of neighbourhood safer places and involve councils and local communities in their development as appropriate.
- 8.6 The State to have commenced progressively identifying, establishing and advertising designated community refuges and neighbourhood safer places, giving priority to areas where bushfire risk is identified as high.
- 8.7 Municipal councils record the location of designated community fire refuges and neighbourhood safer places in Municipal Fire Prevention Plans and Municipal Emergency Management Plans, and inform residents and visitors about their use and location.
- 8.8 The State to have developed uniform signs for designated community fire refuges and neighbourhood safer places in Victoria.
- 8.9 The CFA maintain an up-to-date, state-wide list showing the precise location of all designated community fire refuges and neighbourhood safer places, and provide the list to DSE, Victoria Police, the State Emergency Service, the Municipal Association of Victoria, the Office of the Emergency Services Commissioner, and the Victorian Bushfire Information Line.
- 8.10 The State report to the Commission on the results of the implementation and effectiveness of its township protection plan program and neighbourhood safer places program.

CFA established the following criteria for neighbourhood safer places:

If a ‘Neighbourhood Safer Place’ (NSP) is an open space, the appropriate separation distance should be greater than **310 metres** from the outer edge of the NSP to the fire hazard or should be prescribed to ensure the maximum potential radiant heat impacting on the site is no more than 2 kW/m².

If a Neighbourhood Safer Place is a building, the appropriate separation distance should be greater than **140 metres** from the outer edge of the building to the fire hazard or should be prescribed to ensure that the maximum potential radiant heat impacting on the building is no more than 10 kW/m².

[http://www.cfa.vic.gov.au/documents/nsp_assessment_guidelines_v3_1.pdf]

On 22 September 2009, CFA’s Executive Manager, Fire Planning Systems, asked the Bushfire Cooperative Research Centre (Bushfire CRC) to prepare a scoping proposal about examining the evidence available in the aftermath of Black Saturday that might be relevant to

the use of designated Neighbourhood Safer Places as places of last resort for civilians to shelter in relative safety during the passage of a bushfire, with particular reference to events on the Gallipoli Park oval at Marysville, and at the Kinglake CFA fire station shed on 7 February 2009, when civilians sheltered at these locations as a last resort when fire impacted the communities of Marysville and Kinglake. Two aspects of the available evidence were examined: human behaviour and fire behaviour.

Several questions concerning human behaviour associated with sheltering on open spaces and in buildings were to be addressed:

1. Why did they choose that location? And what were the circumstances that led them to be there?
2. Did they travel (a) by their own car? (b) By someone else's car? (c) On foot?
3. How hot did they feel?
4. Were they exposed to embers in exposed areas?
5. Did they seek comfort from others?
6. Did any individuals take a leadership role?
7. Did they seek out assistance from emergency services?
8. How did they feel when they got to that location?
9. What actions were they taking during the impact?
10. Did they feel safer than at their home?
11. Were they prepared, i.e. did they have water/food, clothes, etc., to sustain them?
12. How long were they there for and how did they leave?
13. Would they have stayed there even if there were no emergency services personnel there?

Questions to be addressed about fire behaviour included:

1. What can we deduce from the fire behaviour?
2. Could we estimate the radiant heat impact on those sheltering in these locations?
3. What were the separation distances between those sheltering and the flame?
4. What climatic or other factors (e.g. vegetation, wind shift) were present that influenced the radiant heat/ember impact on those sheltering?
5. What was the ember impact on those sheltering?

Three working draft reports were prepared and discussed in the process of developing this final report.

Sources

The following sources were utilised:

1. Transcripts of interviews with survivors conducted by Bushfire CRC Research Taskforce interviewers³. The extracts in the report are identified as 'BCRC TFI#_ _ _ _ , location'.
2. Transcripts of evidence presented to the 2009 Victorian Bushfires Royal Commission⁴. The extracts in the report are identified by witness name, hearing date, and transcript page number.
3. Post-7 February on-line news accounts of survivors' experiences.
4. Books describing survivors' experiences^{5,6,7}.

5. Video footage in the public domain showing events at Gallipoli Park oval at Marysville, and in the Kinglake town centre^{8,9}.
6. Discussions with Bushfire CRC Research Taskforce interviewers and researchers, and experienced fire agency personnel.
7. Follow-up telephone interviews with (i) a survivor who sheltered on Kinglake West oval, and (ii) a CFA Captain who located and then escorted survivors from Callignee oval to safety after the passage of the main fire.
8. The Final Report of the Bushfire CRC Research Taskforce¹⁰.

Marysville: Gallipoli Park Oval

A little before 1500 on Saturday 7 February, a fire was reported at Murrindindi Mill, about 2 kilometres south of Murrindindi on private land. While firefighting assets were deployed promptly, the intensity of the fire was such that it spread rapidly into forests on the Black Range between the Melba and Maroondah Highways. At about 1630, spot fires were reported in the Narbethong area. Spot fires joined and burned towards Marysville from both the south-west and the south-east. A convoy of Marysville residents (about 50 cars) led by police left Marysville heading towards Yea at about 1645. At about 1800, an unsuccessful backburn was attempted in an effort to protect the town. This was hastily abandoned as it was overrun by the advancing main fire at about 1830. Crews withdrew to Gallipoli Park oval as part of their operational plan for withdrawal to a place of relative safety if threatened with entrapment. At about 1850, the town came under severe ember attack and houses and vehicles burned. About 40 civilians joined about 30 emergency services personnel, including CFA and DSE fire crews, sheltering in vehicles at Gallipoli Park on and around the oval as the main fire front passed through, destroying almost all of the houses and other buildings in the town. The Murrindindi Fire resulted in a total of 40 civilian deaths, most in or near Marysville. Approximately 590 houses were destroyed⁴.

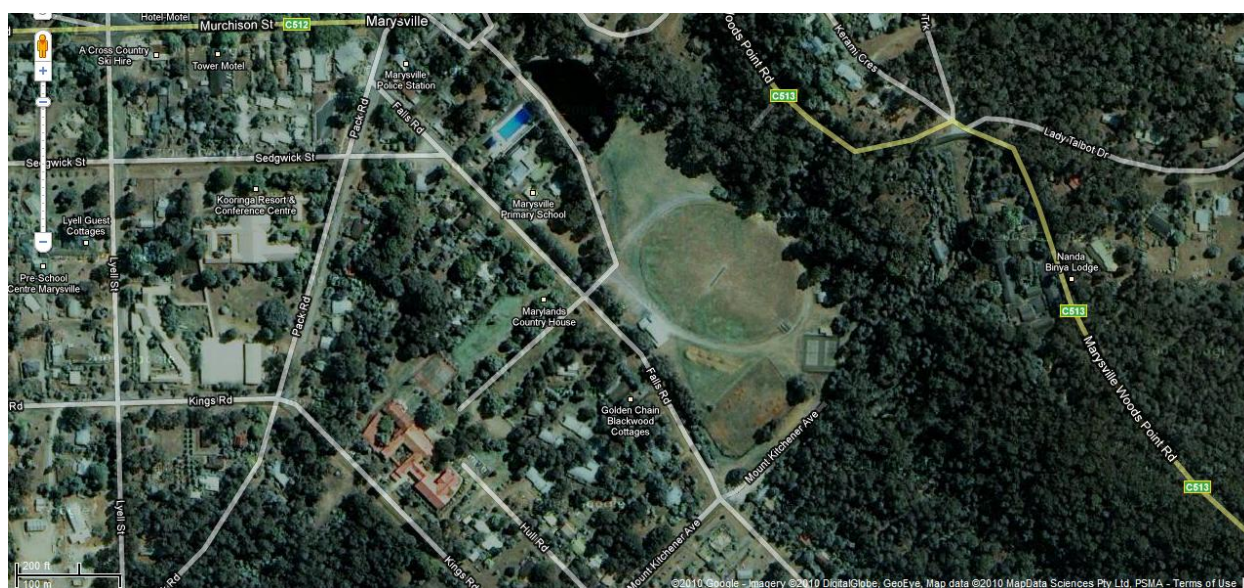


Figure 1: Marysville Gallipoli Park Oval

Gallipoli Park is located about 200 metres south-east of the town centre, on Falls Road, south of the Steavenson River. As the above satellite image shows, it is roughly rectangular, about 250 metres by 150 metres, with the long axis running to the north-west ending at a small ornamental lake. The open area had a quite extensive eucalypt forest area enclosing it in an arc on the east side. On the western side, there were scattered trees along Falls Road, and on residential allotments. There was a primary school to the north-west and a sculpture garden and gallery to the south-east. Various estimates provided by Research Taskforce interviewees and Bushfires Royal Commission witnesses suggest that about 70 people sheltered on the oval, approximately 40 civilians and 30 emergency services personnel, in 30–40 vehicles.

Reasons for choosing to shelter at that location

Among Marysville residents, it seems that three different locations were believed to be 'official' places of refuge, shelter or assembly for evacuation in the event of a bushfire: Gallipoli Park oval, the Cumberland Hotel, and the golf course. It is likely that there was considerable uncertainty among residents of exactly where to proceed if the town was threatened by bushfire.

The fire plan would have been down the oval... That's what I've been told. Though I thought it was down the golf course. People were getting confused. Someone said it's down at the Cumberland... But it was supposed to be down at the oval at some stage, then apparently it got transferred from there to the golf course because there's more room.

BCRC TFI#8ET, Marysville

There is evidence that CFA personnel viewed the Gallipoli Park oval as both a suitable place of refuge for crews threatened by an advancing fire, and as a place where residents would shelter.

But you did know that the place to fall back to was Gallipoli Park oval?

—Yes, I did.

Did you know that from prior knowledge or from a discussion that you had that evening?

—I think definitely from prior knowledge. I think that had been passed on as we were coming in. It just sort of got passed on to your crews. Yes, so from prior knowledge. I think Greg Williamson had sort of reconfirmed that, said, 'Fall back pozy is Gallipoli Park'.

Thomas Henry Jones, CFA, Captain, Yarck Brigade.
12/10/09 JONES XN BY MS RICHARDS, pp. 8618–8619

...at 6.49 you were informed that [crews] were pulling out and going to Gallipoli Park?

—That's correct, Mr Rush.

Did you understand that to be a refuge that would be potentially used not only by CFA but other personnel in the Marysville area?

—Yes. Gallipoli Park has long been recognised within Marysville as, in the old terminology, a refuge. I was aware of that because of my involvement with the municipal emergency management planning committee. There's also a secondary one in Marysville, which is the golf club. I was quite comfortable with the strike teams going to Gallipoli Park as a place of safety.

Peter Vincent Rice, CFA Group Officer, Alexandra Group.
08/10/09 RICE XN BY MR RUSH, p. 8535

Then we said, well, we'll go, we're meant to be on the oval. So we went down the oval and all the trees were burning across the gateway to the oval, stopped for a minute and I said, well, you know what's on the other side, and we drove through the flames and parked on the oval.

BCRC TFI#13IB, Marysville; CFA volunteer

It also seems likely that some residents viewed the oval as a suitable place to shelter simply because of its physical characteristics – a large open area conveniently close to the town centre:

Interviewer: So it just was a local network that had [developed] that said, go to the oval or...?

I think it was just the logical place for people to go to because it is the only cleared open space in town. I am not sure why people went there rather than just left town but I don't think anybody including myself had any idea of the severity of the fire.

BCRC TFI#16NT, Marysville; SES volunteer

There is evidence that some residents did not regard the oval as a safe place to shelter:

I know the gathering point was the football oval. A lot of people in the area that I know were always concerned about the amount of trees and everything there. There's a lot of fuel around that footy oval.

BCRC TFI#33NT, Marysville

Circumstances that led people to shelter at this location

Most of the interviewees were forced to the oval because of some combination of: (a) being initially unaware of the imminent threat of the fire; (b) not being prepared to defend their house; (c) feeling fearful of the evident intensity of the approaching fire; (d) believing that it would be unsafe to attempt to flee the town. No civilians reported that they went to the oval because they expected emergency services personnel to be there.

One interviewee reported attempting to drive away from the town, but being forced to turn back because of fire and driving to the oval as a last resort.

How did they travel to this location?

All of those interviewed drove to the oval in a vehicle: CFA and DSE personnel were in agency vehicles, several civilians drove with family members, neighbours, or friends as passengers, others drove to the oval with their pets (dogs, cats).

There were no reports of people arriving at the oval on foot. It seems that some people did arrive on foot at the oval after the main fire passed through, having sheltered elsewhere. It is likely that at least one person perished while attempting to reach the oval on foot:

This property has two fatalities recorded. J_____ 's body was recovered in the house. N_____ fled the house. N_____ was 8 months pregnant. Her body was found in the vicinity of the oval on Falls Road.

BCRC TFI#51LT, Marysville

Experiences

It is most important to note that, apparently, all of those who took refuge on or around the oval did so **by sheltering in vehicles during the main passage of the fire**. There were no reports of any individual remaining unprotected on the oval during the main passage of the fire, although one person took refuge in the adjoining lake:

—...the entire sky seemed to catch fire and then it absolutely rained embers, just an absolute meteor shower of embers. Very thankfully, of course, I had my (—overhanging tree—) branch. There was hissing going on all around me and I paddled out...

From time to time did you immerse yourself in the water?

—Yes, I had to several times, it got very dense and the air got very hot. I was very parched and I was constantly sipping water off the surface of the lake and taking in air but at various times the ember shower was so thick that it was necessary to go under the water.

Daryl Hull 25/5/09 HULL XN, p. 1175

There were no fatalities among those who sheltered at the oval, and there were no reports of any injuries being sustained while sheltering. Some civilians were physically stressed by the heat and smoke, but all recovered.

For most civilians, the experience was apparently very stressful:

Then there's 40 people trying to give each other support. The kids were crying, the women were crying, the blokes are crying – everybody's crying – because what happened was it was all in fear of our lives.

BCRC TFI#15SS, Marysville

For experienced firefighters, conditions on the oval were recalled as hazardous and unpleasant, but not life-threatening:

What were the conditions like on the oval in the 15, 20 minutes or so after you first arrived?

—All around us was being impacted by fire, but I was 100 per cent happy of where we were and what we were doing. The oval is quite close to the school. The school is just sort of next – and then there is the pavilion. Everything was on fire, not initially – the school and the pavilion weren't on fire, but sort of back further there was a lot of bush and then there were buildings on fire. There was never any real thought of us going out to try and save a building or school or anything because the risk of trees falling on top of you was just too great. So probably in the first five or so minutes, 10 minutes, the fire wasn't sort of right on us, but after not very long at all there was – I couldn't really give you a timeframe, but there were gas cylinders venting. So when they get hot there's lots of gas sort of venting into the – burning off, so big blue flames. Marysville is just on bottled gas. There's a lot of those

big bulk cylinders. They were burning. After a while just everything was burning. Subsequently the school and the pavilion were burning. Really, there was nothing we were able to do except to sort of sit it out and watch it all sort of unfold, really.

At some stage was there an ember shower?

—Yes, look, throughout. I can remember looking up repeatedly and just seeing just, like, showers of embers. It was like a shower. There were just embers falling down on top of us for a considerable amount of the time, yes.

Thomas Jones, 5th Lieutenant Yarck Brigade.12/10/09
JONES XN BY MS RICHARDS, p. 8650

The following account of the impact of the fire on the oval area was given by a witness at the Royal Commission. He is an experienced DSE firefighter and was in a leadership role for fire crews sheltering on the oval. He also made the point that it was necessary for people to shelter in vehicles to escape the embers and smoke during the passage of the main fire.

Mr Cobb, when you eventually went to the oval at Marysville as the fires were approaching the town, roughly how many people would have been at the oval, in your estimation?

—I had the impression that there may have been in the order of perhaps 70. The majority were on the football ground itself and the firefighting appliances, some were on the football ground, but the majority of those were on the large lawn area between the oval and the lake, the ornamental lake in the park there. People were scattered about and moving around from vehicle to vehicle, but I believe in the order of potentially 70 as a minimum.

How safe in your estimation was it for the people sheltering at the oval while the main force of the fires moved through the town?

—During that initial blast, if I could describe it that way, of the front moving through the town, it was certainly not a comfortable place to be, but in terms of direct flames impacting on us there was no feeling of immediate threat. There was a period where people had to be inside a vehicle with the windows wound up to be protected from the thick smoke and embers that were blowing across the ground, but there was at no point where I felt that fire would directly impact on the vehicles or the people that were on the football ground or the grassy area just to the north-west of the ground.

Peter Barret Cobb, DSE Forest Ranger, 13/10/09
COBB XN BY MR ROZEN, p. 8781

Other firefighters in vehicles on the oval were also, apparently, unconcerned at the time about how events were unfolding:

But I was on the oval and I don't remember feeling anything hot, anything much. I just watched stuff burning around me, so I don't think it was hot down there. I was itching just to get out and do something but, then again, I was crazy. I even asked the driver of our truck – we call

him F____ – I said, ‘F____, I suppose you'd shoot me if I wanted to walk up there and get my dog?’ I felt like I could, though, you know, it's only 800 metres or something.

BCRC TFI#13IT, Marysville; CFA volunteer

Heat

All the civilians interviewed commented on the heat as they sheltered inside their vehicles, and almost all reported having the vehicle air conditioner running.

...the fire, yeah, yeah. It hit like a tornado. The wind was incredible, actually the wind was going that way, then that way, and that way. It was just every direction. You just couldn't look. I couldn't believe it how it turned. I swear that when the fire was actually blazing hard, the wind sort of made probably its own sort of air... But, so, yeah pretty scary and extremely hot. I reckon it would be well over 70 Celsius. Well over, because my car, I wouldn't even touch the windows. As I say, I had three dogs in the car at the time and I thought if one of those dog's noses touch a window, they shatter and that's it – we're done. I had the air conditioning on, I had the air conditioner going and it was still that hot, the dogs were – I was sweating – I was just pouring with sweat. Actually dripping, it's incredible the heat. I thought any second now the heat's going to, well now, kill us for sure. But just – it was too hot.

CRC TFI#8ET, Marysville

Embers

All those interviewed commented on the embers impacting:

It wasn't a fire, it was a monster. The way it – I was on the camera filming little videos and you could hear the wind. That's inside the car with the windows up and the wind was incredible. Hunks of wood flying through the air and embers and that. Pieces of wood, not leaves, pieces of wood. The car – little – it's a little mangled, but it had little marks all over it, charcoal burn and that everywhere.

Interviewer: So there were just embers flying everywhere?

Yeah chunks of wood, you know, that big. You can actually see it on the films, you can actually see things flying, sparks and stuff in flames and that. It's embers. That's the first time I've actually seen embers like that.

CRC TFI#8ET, Marysville

(The interviewee could not be re-contacted to obtain a copy of the video)

The above account of solid objects striking vehicles on the oval during the main fire impact is consistent with another report of what it was like when the fire struck the town:

My first experience interviewing in Marysville was an informal chat with one of the first residents allowed back through the roadblocks... He was at his destroyed home with his girlfriend, who was visibly distressed. My judgment at the time was not to conduct a formal interview, but the chap was happy to have a quick chat. To cut a long story short, he corroborated that they were not dealing with embers

but he used the word 'small missiles' of burning chunks of wood (bark?).

Bushfire CRC Taskforce interviewer

Social support

During the height of the fire impact, all those on and around the oval were sheltering inside vehicles because of the heat, smoke, and embers. The accounts suggest that those who were alone in their vehicle may have experienced higher levels of anxiety.

After the fire had passed and people could get out of their vehicles, the presence of DSE and CFA personnel on the oval was quite evidently reassuring for the survivors (see below).

Role of emergency service personnel

There is no evidence of organised defence or protection of civilians by CFA or DSE personnel:

Interviewer: ...So there were a few tankers or just your tanker?

No, no, shitloads. They had a whole lot of DSE guys. We were deployed by the DSE along Kings Road and the DSE guys had some little trucks on there and they had their trucks, I think – this is just my impression, I can't really remember. I just seem to remember, I would have thought there were 10–20 trucks there. I don't know how many trucks were there.

Interviewer: Yeah. What I've heard and from what other people have told me, they sort of, a circle like a wagon train sort of thing?

No, on the oval everyone sort of parked down there. We just, it wasn't really, I don't think so.

Interviewer: No?

They were just parked. I think they were more or less parked like you would at any staging point. I mean they drove through the fence to get there. Like, the trees by the gate were all on fire.

BCRC TFI#13IB, Marysville; CFA volunteer

From what you could see, were the CFA and/or DSE vehicles doing anything to protect the people that were on the oval or were they with you in the middle of the oval in a sort of sheltering situation?

—They were sheltering. There was nothing they could do. It was just way out of our control to do anything. As I said, it was a surreal experience. It was as though you just weren't even part of that whole environment. There was nothing they could do. They looked after us, they were very, very good. They made sure everybody had water and ration packs and just kept moving around as best they can.

Graeme Maxwell Brown, Marysville resident.
14/10/09 BROWN XN BY MR ROZEN, p. 8999

However, some DSE personnel did engage in some limited reactive firefighting activity:

...you describe in your statement seeing fire to the south-east of the oval when you arrived there?

—That's correct, yes, and to the north-east.

There were CFA crews at the oval at the same time?

—There were, yes.

And you describe how you put out a spot fire on the oval and together with Mr Bourke you patrolled the perimeter of the oval?

—Yes.

At one point did the pavilion catch fire?

—Yes, on more than one occasion I observed that the pavilion had fire on it, yes.

What, if anything, did you do about that?

—At the earlier point where we observed fire, we actually extinguished it underneath the grandstand concrete stair ramp at the front of the building. We extinguished a fire underneath that and also one on the roof guttering. At a later stage, as the town was becoming more involved with fire and more of the buildings were catching, we left the pavilion alone.

Were there any discussions between yourself and any of the CFA firefighters about what to do in relation to the pavilion?

—Not at that time with any CFA member.

Peter Barret Cobb, DSE Forest Ranger, 13/10/09
COBB XN BY MR ROZEN, p. 8779

After the fire had passed, CFA and DSE personnel attended to the needs, physical and emotional, of those who had sheltered on the oval.

At some stage was there some attention paid to sustenance for people who were gathered on the oval?

—Yes, there certainly was. We spent the night on the oval and we were able to share some of the rations from the tanker and indeed the pumper and the support vehicle, but having spent the night there under fairly rough conditions, and at this stage I would like to mention that people were simply doing things. We had the gentleman that purchased our Nanda Binya Lodge some 10 days beforehand lost his wife and two children. He was rather badly burnt. He'd staggered down from Nanda Binya Lodge to the oval and my wife and other ladies nursed that man throughout the night and indeed until early morning, and there were people coming onto the oval with incredible

stories of miraculous escapes. So there was a lot of emotion and people embracing each other and so delighted to know that they were safe and sound. Then at some stage we decided that we woke up so hungry and so thirsty and it was decided that we would go to the Marysville Bakery, which we did, and we took two or three wives with us, CFA member wives, and we proceeded to break into the Marysville Bakery...

John Malcolm, CFA volunteer, Marysville Brigade,
12/10/09 MALCOLM XN BY MS RICHARDS, p. 8707

Preparation

None of the civilians interviewed had prepared in any way to take refuge or to shelter: none had water, food, blankets or the like. A few had put portable 'valuables' in their vehicles, and a few had their pets with them:

Everywhere was burning all around us but I felt like a really safe spot, like the trees were burning around us and the hills were burning all around us and gas bottles were exploding in all the guest houses and everything but you felt we're safe here because it's just a big open grass area...and like I had the dog in the back of the car as well.

BCRC TFI#18PNS, Marysville

There is no evidence of any preparation activity by emergency services for Gallipoli Park to serve as a place of refuge or shelter for either civilians or emergency services personnel. It seems that most people were on the oval for at least 12 hours.

Fire behaviour

The following seems likely, in the light of reports by Bushfire CRC Research Taskforce interviewees, evidence presented to the Bushfires Royal Commission, and the Bushfire CRC Research Taskforce Final Report¹¹:

- The fire came from the south-west, following a wind change and it impacted on those sheltering on and near the Gallipoli Park oval at about 1850. The fire intensity was high (Forest Fire Danger Index (FFDI) was probably in the range 50–110), there was full crowning in the surrounding trees. The wind was strong (25–35 km/h, gusting to 70 km/h).
- The radiant heat impacting on those vehicles sheltering on and adjacent to the oval is very unlikely to have exceeded 10 kW/m².¹²
- The separation distances of vehicles from sources of radiant heat were 40–60 metres.
- The major factors influencing the radiant heat and ember attack on those sheltering included: (a) a lengthy period of drought, and high temperatures and little rain in the month preceding the fire; (b) high temperatures (38–42°C), low relative humidity (10–13%), and strong winds (25–35 km/h, gusting to 70 km/h) on the day; and (c) significant tree cover around Gallipoli Park – although this was more dense on the eastern side of the oval compared with the western side.

- The ember impact on vehicles during the passage of the main fire was severe, and some embers were of large size, sufficient to cause impact damage on some vehicles.

The video footage recorded by a survivor on the oval⁸ was taken after the passage of the main fire. It shows structures burning along Falls Road, on the western side of the oval.

An appraisal

During a session of the Victorian Bushfires Royal Commission, the DSE witness quoted previously, who was present on the oval on the night of 7 February, was asked to give his considered appraisal of the Gallipoli Park oval as a ‘safer neighbourhood place’:

With the concept of a safer neighbourhood place that's emerged during the course of the Royal Commission, would you have any estimation of how many people could seek refuge on an oval of that kind without the numbers increasing the insecurity to the whole?

—It is a little hard to envisage, but certainly from what I saw on that night that sort of area had the capacity for a lot more people than it did. It might require some more orderly planning or arranging of vehicles, especially on the football ground, to maximise, obviously, the amount of vehicles that you could get in there, but also to ensure that there was sort of access and egress, if you like, during any incident. I would expect quite readily you could perhaps handle 500 people or more, even. If it was the football oval alone, probably not, but it has quite a large expansive grass area adjacent to the football ground and the lake and the river, which also sort of enhance its value as a refuge. It had been sort of, I guess, my lifelong sort of thought in the back of mind that that was the place to be in the event of an incident.

Peter Barret Cobb, DSE Forest Ranger, 13/10/09
COBB XXN Bushfires Royal Commission BY MR
LIVERMORE, p. 8782

Postscript: Marysville CFA brigade shed

While Gallipoli Park oval was the main location used by civilians and emergency services personnel to shelter when the main run of the fire impacted on the town, it should be noted that eight people sheltered passively, but safely, in the CFA brigade shed on Barton Avenue (backing on to Murchison Street – location arrowed):

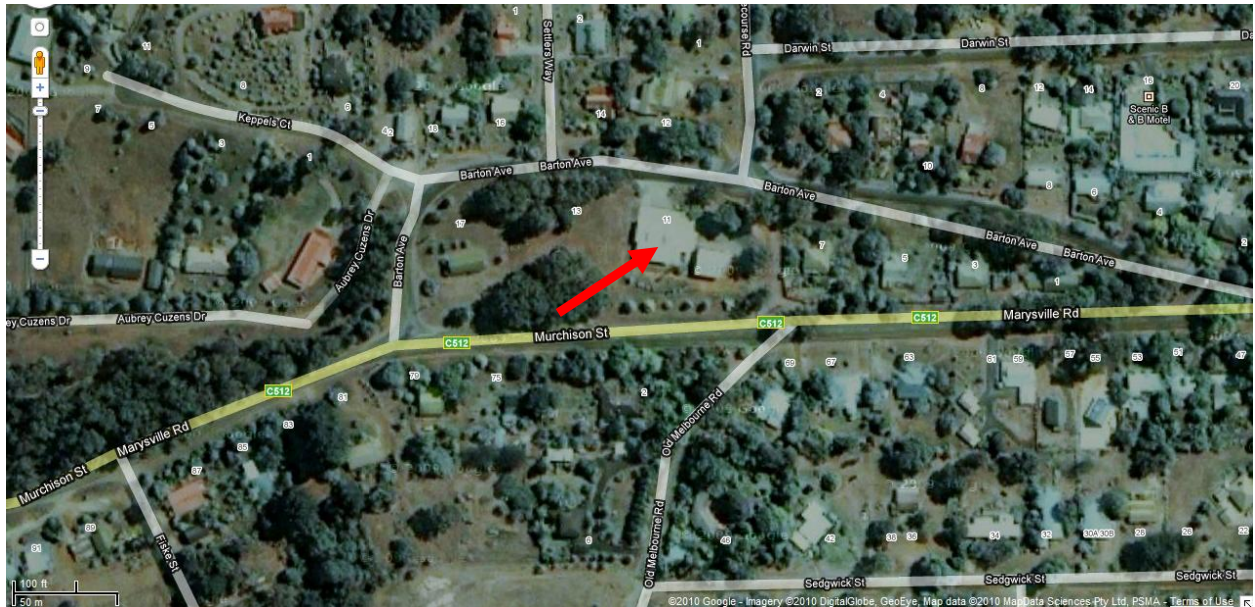


Figure 2: Marysville CFA Fire Shed (Arrowed)

As can be seen in the above satellite photograph, the fire shed was surrounded by scattered treed areas. There was a 20–30-metre partially cleared space to the west and south. It seems that while the shed was impacted by radiant heat and embers, the safety of those sheltering inside was never threatened, although cars and houses along Barton Avenue were destroyed:

But there were people remaining at the CFA shed?

—What, SES?

No, CFA?

—Yes, CFA.

Yourself, your sister?

—Yes, and Briarley.

And who else?

—Judy Ratcliffe; Ian Thompson, the policeman; Glen Fiske, the captain; Richard Uden and his wife, Leonie.

So there were eight people altogether?

—And two dogs.

What warning did you have that there was a very large fire about to hit the station?

—Well, I think it was the roar. It was just horrendous, the roar. Then everything just started going black.

What steps did those of you who were in the shed take to take shelter?

—We just said to the girls to get into our overalls, put our boots on. We just sat in the passage, and just sat there. The smoke started coming in under the door. We got tea towels and wet them down and put them over our heads and we just waited it out.

About how long did you wait it out there?

—I asked Glen and he said we had to wait for half an hour before the front went over.

After about that time were you able to see out of the glass doors?

—Yes, we got up from the passage and went out to the glass doors and just had a look and everything was on fire. The cars in the car park were on fire. All the houses in front of us were on fire.

Pauline Marion Harrow, CFA volunteer,
Communications Officer, Marysville Brigade. 12/10/09
HARROW XN BY MS RICHARDS, p. 8720

Kinglake: CFA fire shed and adjacent streets and buildings

At about 1150 on Saturday 7 February, fire was reported at Saunders Road, Kilmore East. The fire travelled in a south-easterly direction and crossed the Hume Highway at Heathcote Junction at 1358. At Kinglake, power failed at 1655 and soon after, heavy smoke entered the town from fires burning in the St Andrews area to the south west. By 1730, Kinglake was under heavy ember attack from the south-west, with spot fires close to the CFA fire station. Buildings and cars in and around the town centre began burning at about 1745. Many civilians in cars had fled the approaching fires and sheltered in vehicles in streets and parking areas near the fire station and around the National Park Hotel; others sheltered in the Hotel and in the CFA fire shed on Aitken Crescent, just north of the National Park Hotel (Melways 380 E10, see location shown below). There were 38 deaths in and around the town of Kinglake, mostly in houses, with a few in vehicles according to evidence presented to the Royal Commission on 28 May, 2009.

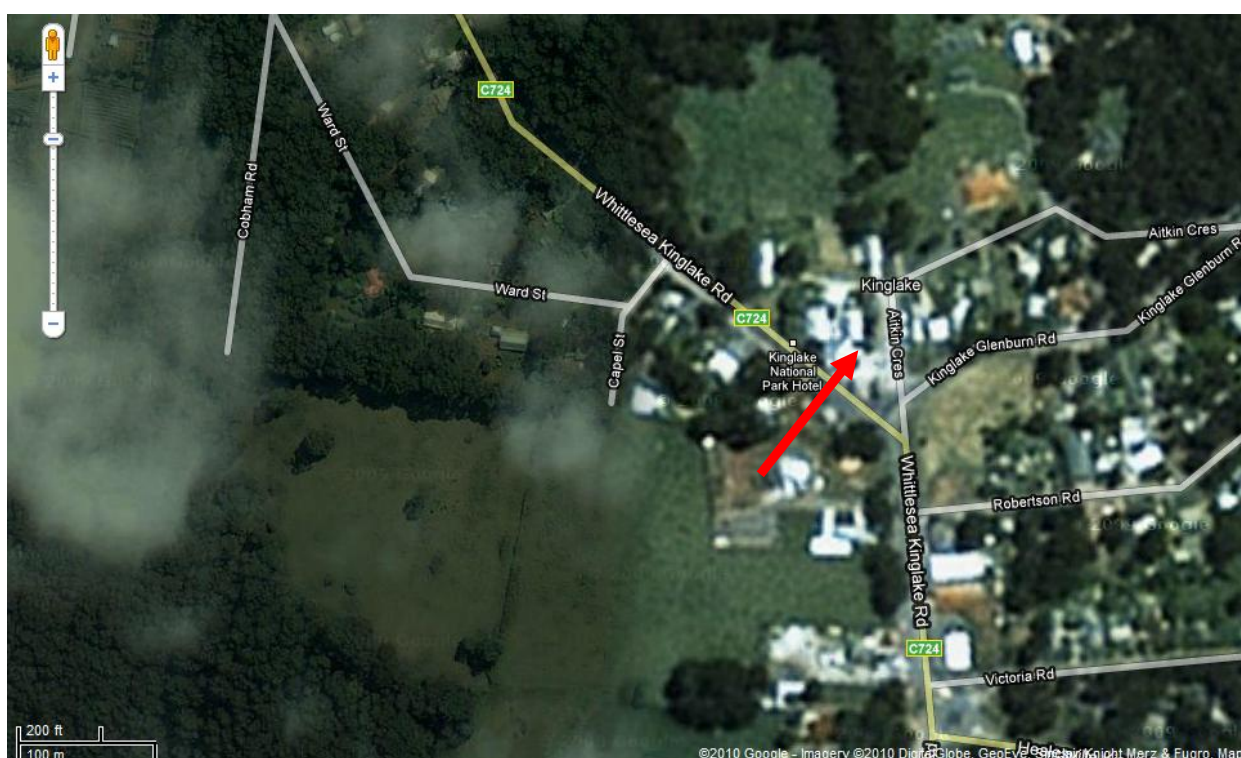


Figure 3: Kinglake - CFA Shed (Arrowed)

The satellite image above is not very clear, but it shows scattered treed areas to the west and south of the shed, with dwellings and shops along the Whittlesea-Kinglake Road. Note the extensive cleared areas to the west and south of the town area.

Reasons for choosing to shelter at that location

It appears that most of those who sheltered in or near the Kinglake CFA fire shed simply 'ended up there' because they could not think of an alternative, safer, place to seek shelter or protection. There is no indication that residents in general viewed the shed as an 'official' place of refuge or had planned in advance to go there.

All the embers that were coming down and it went black all of a sudden. It just went completely black. You couldn't see two feet in front of you and we just said 'Get in the cars and go'. We just threw the dogs, the two cats, the kids, myself, and I – and we took off down the road. We sort of – Wayne was down the bottom end talking to the guy wondering whether we had to go. He told us there is a CFA in Kinglake.

BCRC TFI#1ES, Kinglake

...we got turned back by the flames and the smoke. He dropped me off at the Kinglake Fire Station and that's where we stayed until the fire zoomed past.

Interviewer: Is that a known staging point?

No mate, no...He just dropped me there. Like, I had no idea.

BCRC TFI#19WS, Kinglake

The Captain of the Kinglake CFA Brigade used his command vehicle as a road block to prevent evacuation into the path of the fire and advised many people to remain in the town centre.

—We'd blocked the road at the roundabout and we stayed there with the brigade car and the lights on. We had numerous people coming up to us saying, 'Where should we go, what should we do?'

Did you determine a course of action in relation to those requests?

—I did.

And what was that?

—My advice to them was that they couldn't traverse particular roads – Whittlesea, definitely the St Andrews Road that I had just come up. I wasn't sure what the road to Yarra Glen was like. I knew the column of smoke behind me was blowing in that direction. And I had also heard previously that there was a fire at the Murrindindi Mill or Murrindindi, sorry, the Murrindindi area. So I wasn't too sure what the road was like to Yea. So in a position like that, I couldn't give advice, firm advice. The best advice I could give was to stay in the main centre of town.

Paul Hendrie, Captain CFA Kinglake Brigade.
20/5/09 HENDRIE XN, pp. 864–866

Finally, it should be noted that unlike the situation in Marysville, there was no large, cleared, public-access area of land to serve as a 'natural' area of refuge close to the town centre to which people could evacuate.

Circumstances that led people to shelter at this location

Most of the interviewees found themselves at the Kinglake CFA fire shed because of some combination of: (a) being initially unaware of the imminent threat of the fire; (b) not being prepared to defend their house; (c) feeling fearful of the evident intensity of the approaching

fire; (d) being unable to flee to safety elsewhere because they were unable to (see below), or were advised not to (see above).

We were going to go to the Kinglake West shed but as we got up to the end of National Park Road and looked down towards Kinglake West, there was fire everywhere there. It just looked like an absolute no-go so we decided to head towards Kinglake...

BCRC TFI#16QSS, Kinglake West

How did they travel to this location?

All those interviewed arrived in vehicles. It is possible that some local residents travelled on foot, but no reports of such could be found.

Experiences

There were no reports of any fire-related injuries being sustained by those sheltering in the fire shed, or by people sheltering in nearby buildings or vehicles. A number of people who had been injured elsewhere came, or were brought, to the shed for treatment – mostly with burns.

For the civilians sheltering in the shed, the experience was frightening and stressful. Conditions were unpleasantly hot and crowded. There were no reports of actual life-threatening incidents. However, the shed and adjacent buildings were actively defended by the few CFA personnel present, assisted by some civilians. There were fears about exploding gas bottles, cars igniting, and flames and embers from other structures impacting on the shed.

We parked in a car park near the CFA thing and then they told us to move our cars away from the hotel because it had big gas bottles and they thought that was going to go up, so we moved our cars, but there was just cars everywhere. Then a lady pulled up in her car and started crying because she couldn't find her husband and her baby, and then we got the people to take her in, because she had two dogs in the back, so everyone went in the shed with dogs and God knows what else and birds and people and things everywhere... Yeah, and all we could hear was the hoses going on the roof, like I guess they were hosing the roof down because it is only a tin thing, and then sort of they said 'All right', we had gas masks and they were giving us water and watering the pets and that down and just getting everyone in there. Then it sort of died down a bit and the cool change started to come through but it wasn't raining. Then they put us outside but when we were outside you could see the fires all the way around and the gas bottles blowing and then the garage blew up down the road.

BCRC TFI#1ES, Kinglake

Interviewer: How many people were there at the time?

There would have been about 50 of us in there, I reckon.

Interviewer: Do you think you were safe in there?

Not at all. We all thought we were going to die.

Interviewer: Did you?

Bloody oath, yes. No-one panicked. No-one was screaming or in hysterics or anything like that. Everyone was very solemn but trying to be helpful, getting water for the pets, because everyone had their cats, dogs, snakes, birds, there were even a goat tied up outside, yes. After about an hour, I think it was about an hour – I couldn't tell you how long we were even in there. It was very hot. I was having palpitations and after about an hour they let us out and said 'It is cooler out here now', because the main fire had gone past. I think it was an hour. I can't be sure.

BCRC TFI#19WS, Kinglake

I went up to Kinglake and we sheltered in the fire shed up there. The CFA shed – they hosed the shed while the fire went over the top. When it got there, it went black like it was night and with glowing red in it and we could hear on top of the shed, the embers hitting on the thing. All the time there are gas bottles and the trees exploding. It was just like being in a war zone. People firing artillery.

Interviewer: So when you got there, there were a lot of other people already there?

There were a lot of people and then they came and... Trees exploding and the hardware in the garage, the gas bottles would go bang and everything else. It was just like I would imagine it would be in a war zone. Fire, heat, you know.

Interviewer: How was the feeling of the people in the shed at that time?

Some people were panicking. One teenage girl was screaming and hysterical. That lasted until when the fire went past, some of the people with burns came in. I think she sort of felt a bit of a dill when she saw how badly people were not screaming and they were really badly burned. You know?

BCRC TFI#21QSS, Kinglake West

The Captain of the Kinglake Brigade was, apparently, concerned about the safety of those sheltering in the fire shed:

Inside the station, says Mr Hendrie, "there was just people everywhere... It was stinking hot in there and water was all over the floor. The smoke was coming in."

It was like Noah's ark: "There were all the animals. People brought all of their dogs with them. I am surprised that none of the dogs even attacked each other."

"Some people panicked a bit. 'What are we going to do?' At one stage I screamed at the top of me lungs, 'Quiet! Come on! This is what we are going to do!' We set up quickfills (water-containers). We had plenty of water. We opened up the drinking tank too and wet all around the station...

"Once I told people to calm down, that we were safe, that nothing was going to happen to them — but I didn't know that! — they were calm."

People hosed the building and grass around it. They could see the red glow of the fire over the ridge of the hill at the other end of the main street, licking up from St Andrews.

"Then all of a sudden there was this black. The column of fire came up virtually over us. It spotted into the paddock and the trees behind the station. It burnt it all. We heard cars exploding. The service station went up. Hundred-pound gas tanks were going up — just going BANG!, the loudest sound I have ever heard. It just got worse and there was blackness all over."

Source: <http://www.theage.com.au/national/battle-to-save-lives-against-unpredictable-enemy-20090210-83kx.html>

At least two civilians took part in active defence of the shed and protection of adjoining buildings:

Yes, at the Kinglake fire shed. From what I saw there was the captain and two other members. One of the members was panicking, she was maybe 15 or I think 17 actually and she was obviously not having a good time of it, so my step dad and I decided to put on CFA clothes. I went out to help this other member called D_____ and helped her, dragged the hose around everywhere. We put out a lot of spot fires.

Interviewer: So you were defending the station itself?

I was defending the station itself. At one point I actually had to drag the hose across to the doctor's surgery and I saved that. I didn't know why I was saving it but later on, about half an hour later, the captain told me to break into it so we broke into it and got all these medical supplies. We took them back and we realised why because there were burnt people and stuff like that.

BCRC TFI#16QSS, Kinglake West

The National Park Hotel, adjacent to the CFA shed, came under severe ember attack:

Around this time did the hotel come under ember attack?

—Yes. When I was running up and down the side of the hotel, the embers were hailing down. I can't describe it to you apart from hail. The noise on the roof of Lawson's function room was just like hail except it was red and they were just hailing down and pushing across the roof with such force.

Sharon Lisa McCulloch. 09/06/09
McCULLOCH XN, p. 2454

One interviewee who sheltered in her car with her pet cat outside the fire shed commented on the embers impacting the area:

Then I looked over to above the CFA building and there were just huge flames coming up. I thought, they're just there, are we supposed to be assembled here or have I come to the wrong place? There were other cars there. The bloke I was asking just shook his head. So I got back in my car and thought, well, okay. Then it gradually, just bit by bit, just got darker and darker and it was like night time. The embers were huge, like those barbeque brick things. Heat bead things. They were huge and it was whirling around and there was ash and willy willies of burning embers.

BCRC TFI#40QSS, Kinglake West

A car parked near to the Hotel caught fire. It was extinguished by a local resident, a member of the Kinglake West fire brigade, who assisted those sheltering around the Kinglake CFA fire shed.

The neighbour over the road, I took him and his dog up to the Kinglake fire station, dropped them off, helped a few other people around that were struggling to get them into the Kinglake fire station. There was a car that started to catch fire at the pub. I put that out with the dry chem that I carry because it was going to start to threaten cars that were right up against the pub. So we didn't really need any more destruction immediately around that fire station, so we did that... Important to save it. But stopping that car from burning and accelerating and losing other cars was probably fairly important. Then after a while I sat in my car with the air conditioner going watching everything happening around me failing. I let that subside for a bit. Saw the hardware burning and so on, so I thought I would come back up and see what had occurred here, and my shed had started to catch – was starting to burn at that stage...

BCRC TFI#2WS, Kinglake; Kinglake West CFA volunteer

One resident described driving into the Kinglake town centre to take shelter, not being able to find a safe place to park, turning around to drive home, and being involved in a vehicle collision in the poor visibility:

I turned left and went into town. There was so many cars in there. There was nowhere to park, and the fire was rushing across the road. So I turned around and we came back up the road here. And we got through all this part here, which was still – wasn't on fire – but it was pitch black. It was really black. You couldn't see anything. And then we had an accident up here. Someone ran in the back of us.

BCRC TFI#23TID, Kinglake

Role of emergency services personnel

There were no firefighting appliances at the Kinglake CFA fire shed; these had been deployed to other locations. The Captain of the Kinglake Brigade made preparations to defend the station and adjacent buildings.

With those people in the main street, did you set out to attempt to take precautionary – ?

—I did, I did later on over at the station. We got a couple of pumps out and connected them to tanks and run some hoses. We did the same behind the hotel. That's the extent of what we did...

From the precautions that you have outlined – well, firstly I should ask you did you have a concern that the brigade itself, the Kinglake fire station and the pub – ?

—I did. I did, yes. That was the reason why we deployed the number of pumps and got some volunteers out of the station to help drag stuff around and drag hoses.

The best you could using the hoses and pumps and the like to protect the town?

—The part where a number of people were we had a street full of cars and people in the cars, refuging in the cars, a number of people refuging in the station. There were a number of people in the hotel that I got out.

Paul Hendrie, Captain CFA Kinglake Brigade.
20/5/09 HENDRIE XN, pp. 864–866

A CFA volunteer assisted the owners of the nearby National Park Hotel to prepare to defend the property:

...tanks at the hotel have some big couplings for fire emergencies. One of the CFA volunteers put a coupling on that and had a fire pump going on our tank.

Sharon Lisa McCulloch. 09/06/09
McCULLOCH XN, p. 2453

As described in the previous section, an off-duty CFA volunteer from the Kinglake West brigade extinguished a burning car outside the National Park Hotel that threatened to ignite other cars and thus the Hotel.

Preparation

None of the civilians interviewed had prepared in any way to take refuge or to shelter: none had water, food, blankets or the like. Some had stowed portable valuables in their vehicles, and some had their pets with them. It seems that most people stayed in the vicinity of the fire station for three hours or more.

Fire station personnel made preparations to defend the shed against fire (see above), but there were no reports that they made any specific preparations to harbor civilians sheltering in the shed.

Fire behaviour

The following seems likely, in the light of reports by Bushfire CRC Research Taskforce interviewees, evidence presented to the Bushfires Royal Commission, and the Bushfire CRC Research Taskforce Final Report¹³:

- The fire came from the south-west, following a wind change and it impacted those sheltering in and near the Kinglake CFA fire shed at about 1745. The shed was exposed to radiant heat and embers from both vegetation and burning structures. The wind was strong.
- The radiant heat impacting on CFA fire shed probably did not exceed 10 kW/m^2 , and is very unlikely to have exceeded 20 kW/m^2 .¹²
- The separation distance of the shed from vegetation was 50–60 metres. Burning structures were probably much closer.
- The major factors influencing the radiant heat and ember attack on those sheltering included: (a) a lengthy period of drought, and high temperatures and little rain in the month preceding the fire; (b) high temperatures ($40\text{--}43^\circ\text{C}$), low relative humidity (5–6%), and strong winds ($45\text{--}60 \text{ km/h}$, gusting to 70 km/h) following the south-westerly wind change on the day; (c) burning vegetation on the western side of the Whittlesea-Kinglake Road; and (d) burning structures along the Whittlesea-Kinglake Road.
- The ember impact on the shed and on vehicles during the passage of the main fire was significant, but not such as to cause damage.

The video footage⁹ shows flames sweeping up towards Kinglake Central from the south-west beside Bowden Spur Road, haphazard parking of vehicles near the National Park Hotel, chaotic vehicle traffic in the town centre, and columns of flame (at least 50 metres high) approaching the town centre from the west.

Kinglake West (Pheasant Creek): CFA Fire shed and adjoining oval

At about 1150 on Saturday 7 February, fire was reported at Saunders Road, Kilmore East. The fire travelled in a south-easterly direction and crossed the Hume Highway at Heathcote Junction at 1358. Between 1400 and 1700, the fire travelled in a south-easterly direction, crossing the Great Dividing Range, and reaching the base of Mount Disappointment at 1530. It crossed the Whittlesea-Kinglake Road to the west of Kinglake West. At about 1630, houses near the Kinglake National Park in the vicinity of Pine Ridge Road came under ember attack from the south-west. All the houses in Pine Ridge Road were destroyed; there were five fatalities. During the afternoon, many residents in the area decided to leave rather than stay and defend their home. Quite a number called into the Kinglake West CFA fire station (on the Whittlesea-Kinglake Road, about 150 metres west of the National Park Road T-junction; see location shown below) seeking advice. Initially they were told to leave the area (see interview transcript BCRC TFI#325OQS, below). At some point, when it was no longer possible to drive out of the area safely, civilians began to congregate at the fire shed and on the nearby oval to the south. A number of civilians sheltered inside the fire shed as the main fire moved through the area, while many civilians sheltered in their vehicles on the oval.



Figure 4: Kinglake West CFA Shed and Oval

The above satellite photograph shows that the oval is about 150×100 metres, with the long axis running north–south. There is an additional cleared area to the north-east where a primary school is located. The oval was surrounded on three sides (open to the north) by a belt of trees. The CFA shed had a large open area to the south-west, with a treed area to the west, and scattered trees to the east.

Reasons for choosing to shelter at that location

There is limited evidence that some local residents believed, incorrectly, that the Kinglake West CFA fire shed was a designated place of assembly in the event of fire:

...I had no idea there was a fire coming up the Mountain Road, as you call it. I would have gone that way because that's where the Kinglake West CFA station is and that's where our assembly area is... near the primary school.

BCRC TFI#40QSS, Kinglake West

This misunderstanding may have arisen because there were, apparently, some unsuccessful attempts made to have the Kinglake West Mechanics Institute Hall (near the CFA fire shed) designated as a fire refuge:

The Kinglake West Mechanics Hall Committee of Management had tried unsuccessfully for 2 years to have the Institute building declared a fire refuge.

BCRC TFI#325OQS(2), Kinglake West

Circumstances that led people to shelter at this location

The limited evidence available suggests that for many, the circumstances under which they came to shelter in the Kinglake West CFA fire shed, or on the adjoining oval, were quite chaotic.

We went to Kinglake West oval and there was six or seven vehicles on the oval, because I'm thinking, 'CFA station will be all right here'. In the haze of panic – and they came down from the CFA station, came down and told us very clearly that they had no intention of defending the oval. They were only going to defend the CFA station, and that we should go to Kinglake, and take the Glenburn Road because it was open which was about half past five by then, 25 to six. We had 30 cars, because I stopped back at the Pheasant Creek shop and said, 'We've been told to go to Kinglake'. And I was the lead of about 30 vehicles, and I got to Bowden Spur Road – where the powerlines are, and I could – see – and next thing we had Thompson Reserve – the fireball coming at us. So we quickly turned around, but I'm unsure that everybody had a chance to turn around and come back
[–interviewee distressed–]. We came back here, our road was blocked off. The smoke was intense; we went through, and the flames were across the road, so we had to drive through the flames not knowing – and it was probably – I don't know – 150 metres of flames – went back to the oval.

BCRC TFI#325OQS, Kinglake West

How did they travel to this location?

Those interviewed arrived in vehicles. It is possible that some local residents travelled on foot, but the remoteness of the fire shed from dwellings makes this unlikely, and no reports of such could be found.

Experiences

There were no reports of any fire-related injuries being sustained by those sheltering in the Kinglake West fire shed, or by people sheltering in vehicles on the adjacent oval to the south.

Little information could be found about the experiences of those sheltering in the fire shed. It was hoped to interview some members of the Kinglake West CFA Brigade who were present when the main fire came through but this did not eventuate. The only account available is:

Interviewer: ...and after you got in the convoy, everyone went to the Kinglake West CFA shed?

Yeah

Interviewer: And what was it like down there?

It was controlled panic, really. It was just emotion, lots of. Yeah, because they actually had put a couple of trucks around the back where the fire front was coming up through, just to protect the CFA area... and then it was just a matter of sit and wait.

BCRC TFI#380OQS, Kinglake West

Apparently, some protection was available from a civilian for the vehicles on the oval to the south of the CFA shed:

...there was a young fellow with a ute who had a water tank on the back, and he said he would... spray us down. We watched the flames come up over the oval, because we knew it was going to come again, and it was like someone went and just blew it at a 40 degree angle. So it burned up the side – so it was up to the left now, instead of the front. It burned across the oval, so we started moving cars around here, and it burned over the next 10–20 minutes, and hour...

BCRC TFI#325OQS, Kinglake West

One report referred to people sheltering (NOT in vehicles) behind the cricket pavilion at the north-eastern end of the oval:

There were about 25 cars on the Kinglake West oval when the main front of the fire came through. There were also some 50–60 cars parked on the Kinglake West Mechanics Institute service road, and on the Whittlesea-Kinglake Road, extending from the Primary School to the fire shed. I believe that most of the people who came with these 50–60 cars sheltered in or near the CFA fire shed. The grass on the oval was ignited by embers, and the drivers had to move the cars twice, most ending up in the north-east corner, near the cricket pavilion. There were some people sheltering behind the cricket pavilion when the fire came through, apparently some people on foot were picked up by drivers *en route* to the oval and some cars were too full for people to shelter in. The young chap with the ute was able to spray the cars on the oval with water to protect them when the grass began to burn. I remember the oval had a cover of about 2 inches of dried grass and I don't know how 2 inches of grass can produce 50-foot flames. I can't remember if any of the cars on the oval was damaged, ours wasn't, but in any case we had

driven through flames when we came back to the oval after being stopped by the fire across the Whittlesea-Kinglake Road at Bowden Spur Road.

BCRC TFI#325OQS(2), Kinglake West

Role of emergency services personnel

The limited evidence available suggests that the fire shed did not need to be actively defended.

Interviewer: ...and then it's still an active fire?

Yeah, there was houses across the road to it, on fire.

Interviewer: So was anybody, there was obviously CFA personnel with hoses, or –?

Yeah, but no, they didn't douse the house fires there, or even the fires near the primary school either. They were just watching, just keeping (a watch) to see where they were going to head.

BCRC TFI#380OQS, Kinglake West

One interviewee was extremely critical of the Kinglake West CFA personnel because of their perceived failure to assist those sheltering on the oval to the south of the fire shed:

... and they stayed in their CFA shed – they've got a 200,000-litre tank that the local community provided for them – they have a fire pump and a generator, and we sat there, they did nothing to try and save anything. And it wasn't until about four hours later, I needed to use the bathroom, I walked up to the CFA station and found 200 people in there. Now, they hadn't come down and said to us, 'Come up to the station', not once.

Interviewer: Okay. Well, I understand you are feeling angry.

Disappointed, angry, pissed-off.

Interviewer: All of the above.

We had junior firefighting teams, and it struck us, and I can't blame the people on the ground, but it struck us that people were too frightened to make poor decisions, so they made the wrong ones, or they made none.

BCRC TFI#325OQS, Kinglake West

Preparation

None of those interviewed who attempted to flee the fire had prepared in any way to take refuge or to shelter: none had water, food, blankets or the like. Some had stowed portable valuables in their vehicles. Most people stayed on the oval or in or near the fire station shed for about 5 hours.

Fire behaviour

The following seems likely, in the light of reports by Bushfire CRC Research Taskforce interviewees, evidence presented to the Bushfires Royal Commission, and the Bushfire CRC Research Taskforce Final Report¹³:

- The fire came from the south-west, following a wind change and it impacted those sheltering on Kinglake West oval at about 1630. The fire intensity was high (FFDIs were probably in the range 90–170). The wind was strong.
- The radiant heat impacting on those vehicles sheltering on the oval is very unlikely to have exceeded 10 kW/m².¹²
- The separation distances of vehicles from trees were about 50–60 metres. However, the grass on the oval caught fire and vehicles had to be moved twice.
- The major factors influencing the radiant heat and ember attack on those sheltering included: (a) a lengthy period of drought, and high temperatures and little rain in the month preceding the fire; (b) high temperatures (40–43°C), low relative humidity (5–6%), and strong winds (45–60 km/h gusting to 70 km/h) following the south-westerly wind change on the day; (c) tree cover around the oval on the western, south, and eastern sides; and (d) fully cured mown grass stubble on the oval.
- The ember impact on vehicles during the passage of the main fire was significant, but not such as to cause damage to vehicles.

Kinglake Memorial Reserve Oval and Kinglake Central Primary School

One of the residents from Kinglake West, interviewed by a member of the Bushfire CRC Research Taskforce, described being unable to reach Kinglake because of fallen trees on the Whittlesea-Kinglake Road, and being forced to turn left into Extons Road and take shelter: initially on the oval, then in the Primary School (location shown below), then when that ignited, returning to his car and, with the occupants of several other vehicles, surviving during the night by moving their cars to different parts of the oval. People were on the oval overnight.

We didn't make it to Kinglake, we turned off to go into the Kinglake footy oval where there was another two cars. By now we're talking embers everywhere, smoke everywhere, we could hardly see each other at all... and two more cars turned up... there were five cars all up. And what we did to get away from the embers... a couple of guys broke into the classroom... and we all ran in there. I laid down with a wet rag over my face. One of the other guys was vomiting because the smoke was that bad. Two of the people stayed out on the oval... and he yelled out to us 'Get out, get out, you're on fire!' The building was on fire... So we all dashed out and for the next two or three hours all we did was move the cars around because the flames were circling the ground all the time... Like, trees like this, all on one side of the footy ground, they caught fire and you could feel the heat was immense and so we moved the cars

over there, then it'd swing around to here and we'd move all the cars, and we did this for about three hours.

BCRC TFI#31QSS, Kinglake West

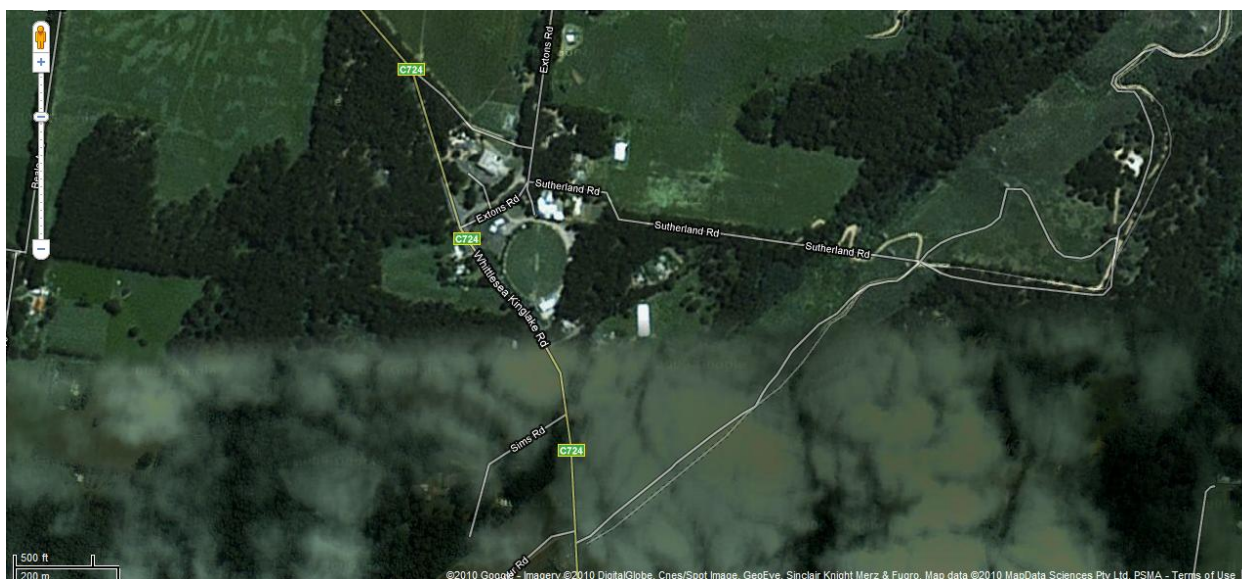


Figure 5: Kinglake Memorial Reserve Oval and Kinglake Central Primary School

As the above satellite photograph shows, the oval is about 150×100 metres, with the long axis running approximately north–south. There was a treed area to the east and the south. There is a cleared area to the west. The Kinglake Central Primary School is to the north, adjacent to the oval.

Fire behaviour

The following seems likely, in the light of reports by Bushfire CRC Research Taskforce interviewees, evidence presented to the Bushfires Royal Commission, and the Bushfire CRC Research Taskforce Final Report¹³:

- The fire came from the south-west, following a wind change and it impacted those sheltering on the Kinglake Central Memorial Park oval at about 1640. The fire intensity was high (FFDIs were probably in the range 90–170). The wind was strong.
- The radiant heat impacting on those vehicles sheltering on the oval is very unlikely to have exceeded 10 kW/m^2 .¹²
- The separation distances of vehicles from flames were probably 60–80 metres.
- The major factors influencing the radiant heat and ember attack on those sheltering included: (a) a lengthy period of drought, and high temperatures and little rain in the month preceding the fire; (b) high temperatures ($40\text{--}43^\circ\text{C}$), low relative humidity (5–6%), and strong winds (45–60 km/h, gusting to 70 km/h) following the south-westerly wind change on the day; and (c) significant tree cover on the southern and eastern sides of the oval.

- The ember impact on vehicles during the passage of the main fire was significant, but not such as to cause damage to vehicles.

Callignee Oval: intersection of Neaves Road and Factory Road

At 1333 on 7 February 2009, a fire was reported in open country but spreading rapidly uphill into a blue gum plantation south of Glendonald Road, 3 kilometres south-east of Churchill, in Gippsland. Spotting was reported up to 20 kilometres ahead of the fire. Following a wind change, the fire travelled in a north-easterly direction, impacting on the communities of Callignee, Traralgon South, and Koornalla. The Churchill Fire resulted in 11 fatalities and the loss of almost 300 homes. There is evidence from both the Bushfire CRC Research Taskforce interviews and information presented to the Bushfires Royal Commission that some residents of Callignee sheltered from the fire in vehicles at an oval near the intersection of Neaves Road and Factory Road, Callignee.



Figure 6: Callignee Oval

The above satellite photograph shows that the oval was surrounded on three sides (with Neaves Road to the east) by trees. The oval is about 150×100 metres, with the long axis running north-east to south-west. There is an additional cleared area to the north-east for parking.

No reports from people who sheltered on the oval could be located. There is limited information from CFA personnel who came upon survivors on the oval after the fire had passed through the area.

And then there was the – a group of people up near the oval where – pretty much where Factory Road is. There was a group of people there. And we lined them up, and we all went back down, and this was probably about 12.30, 1 o'clock, and I called it quits.

Interviewer: There was still a fair bit of fire there?

Yeah. And I called it quits then. I'd done 12 hours on the field.

BCRC TFI#195DS, Callignee; CFA Volunteer

It is unclear how many people were sheltering on the oval when the fire came through and how many made their way to the oval after the main impact, as evidence given to the Bushfires Royal Commission indicates:

—So, several runs were made picking up people as we went and relaying them back to the Traralgon South fire station, until we were finally made aware that people had been congregating on the Callignee oval, so the decision was made to push even further into the community area, of which we hadn't quite been able to get to because of the debris and fire activity to that point.

You made your way down to the oval, having heard reports there would be people there. When you got there what did you see?

—There was very little to see. It was dark and there was a lot of smoke, but there were cars around the oval or on the road close to the oval, and then people simply appeared out of the darkness and from the smoke. A very strange feeling because the expectation for some reason that I drew was there would probably be only a handful of people, when in fact there were several dozen people and a lot of cars.

The fire had already impacted the oval, burnt the oval and the fire station to the ground?

—Yes, that's correct.

Do you know whether those people at the oval had come to the oval after it was impacted by fire or whether they had attempted to shelter there during fire?

—I don't know the answer to that.

But it would seem some of them at least had undamaged vehicles?

—Yes, they did have.

Did you assist them in leading them out of the Callignee oval in a convoy effectively back to Traralgon South?

—Yes, the safest option was for us to form a convoy between our tankers, put as many people into appliances that we could and into the least amount of vehicles that we could, collect them in between the fire tankers and escort them back down the road to the Traralgon South fire station.

Craig Peter Wood; Career Firefighter, Transfield Fire & Rescue Service, RAAF base East Sale, Captain, Willung South CFA Brigade. 22/10/09 WOOD XN BY MS DOYLE, p. 9770

In an interview via telephone on 11 December 2009, Mr Wood said that, to the best of his recollection, there were 12–15 vehicles and about 20–25 people on the oval. He did not know if they had all been sheltering on the oval when the fire came through, but he believed that it would have been extremely difficult to drive to the oval after the impact of the fire because of

fallen trees and power poles. As far as he could recall, none of those present had sustained any injuries, and no vehicles appeared to be damaged. He noticed that the trees on the western side of the oval had crowned, those on the eastern side had not.

Other evidence seems to confirm that people did survive on the oval at the height of the fire:

There's a lady came out of over here. Mrs A_____. She was parked on the oval and they couldn't get any sense out of her. Her husband went missing for two hours. And I don't know why they split up. But the fire was obviously coming towards their house and they've taken off. And he was caught down this oval, caught on a log down here. A tree went across the road. He was caught on it. Two hours later, he walked back up the road here and then met his wife. And then the fire had passed through then, and...

Interviewer: Oh, so they sheltered in a car on the oval?

...out of their home. Well, he must have stayed down there while the fire went through. And after it's gone through, he's come walking back up the road.

BCRC TFI#425ODS, Callignee

One Callignee resident interviewed by the Bushfire CRC Research Taskforce indicated that not all the local residents viewed the oval as a viable place to shelter from the fire on 7 February:

We had a football oval up there, but it wasn't, you know, we didn't take a chance on that, 'cause that's a bigger fire hazard than the rest of the joint. And because there's only one way out of here in a thing like that, and that's that way. I mean, if you go this way, you get burnt to death, 'cause you've got to go to Balook and then – well that's where the fire was coming from, so we believe.

BCRC TFI#55GS, Callignee

Fire behaviour

The following seems likely, in the light of reports by Bushfire CRC Research Taskforce interviewees, evidence presented to the Bushfires Royal Commission, and the Bushfire CRC Research Taskforce Final Report¹⁴:

- The fire came from the south-west, following a wind change. The fire intensity was probably high (FFDIs were probably in the range 70–130). The wind was strong.
- The radiant heat impacting on those vehicles sheltering on the oval is very unlikely to have exceeded 10 kW/m².¹²
- The separation distances of vehicles from flames were probably 40–60 metres.
- The major factors influencing the radiant heat and ember attack on those sheltering included: (a) a lengthy period of drought, and high temperatures and little rain in the month preceding the fire; (b) high temperatures (42–46°C), low relative humidity (5–

7%), and strong winds (25–45 km/h gusting to 65 km/h) following the south-westerly wind change on the day; and (c) significant tree cover on the northern, western, and southern sides of the oval.

Surviving catastrophic wildfire conditions: three vignettes

For the purposes of comparison with the experiences of people sheltering in vehicles on cleared areas, or in CFA fire station sheds, three condensed summaries of accounts from civilians who lived through the fires of 7 February under very marginal conditions of survivability follow. What all three accounts show is survival is possible under the most adverse of conditions.

Inside a vehicle shielded by a carport, near a burning house

So, with your fire underneath your house and the explosion blowing the windows in the side of your house in, what did you and Vicki do?

—Just before that, luckily, when I turned that off, when I turned the gas cock off, the grate blew off and I saw the fire. I said to Vicki, 'Get out' and she was over near the window. She ran over I think to the front door and then the explosion occurred, so if she had have been there, she was gone. Anyhow, she got down. When that explosion happened, I yelled out to get out... Then I had to jump... I should have gone out – anyway... So we just – we ran along the front of the front verandah and it was almost like the fire was right with us and we jumped off the end of the thing. After seeing Harley's cars, I didn't expect my car – I don't know where I was going to go, but the car was there. I said, 'Get in the car'. It was there for some reason. There was a bit of an open ground, maybe. Anyway, the car was there so I jumped in the car, reversed it and smashed the dog trailer out of the way and we parked there. I left the wife in the car, Vicki. I said, 'Just stay here for a minute' and I got out of the car and I went back the other side. I wanted to try to get the dog. I went along the verandah, got about halfway along and I took a lungful of this black, very heavy smoke. Went down on the ground, went down on the verandah. I thought I was gone, couldn't breathe, and I crawled back along the verandah. I just couldn't get to the dog. I just couldn't get to him. I couldn't get to the dog.

You got back to the car?

—Anyway, I crawled back and got back to the car. We sat in the car for about an hour, I suppose. An hour or an hour and a half.

Did you have the car running?

—...I put it on recirc with the airconditioner on and we sat in the car and everything just exploded and burnt around us. Vicki said a couple of times, 'What's going to happen?' – I mean, I couldn't touch the front windscreen. It was red hot. It didn't glow red, but I couldn't touch it, it was really hot. We were okay, so the car stood up, luckily.

That (photograph) shows a carport and you parked on the side of that structure of the carport?

—Yes.

And you said you poked your car out to take the photograph. What happened to the right-hand front of your car?

—It all melted.

Russell Eryl Glenn, Marysville resident,
13/10/09 GLENN XN BY MR RUSH, p. 8818

In a shallow depression on the downwind side of a ridge

...And then the inside wall just caught fire. I was standing next to it, so time to get out.

Interviewer: OK, sure, what were conditions like when you went out?

Hot... And very hot would be the only word for it... So my plan was to get around the back of the house because we were still protected from that – it was just one wall of flame across here. We are standing here and all the trees are catching fire, so we couldn't really go that far... That's about the time I thought that was most likely we were not going to make it... So I basically knocked both of us to the ground and dragged him [–94 year old uncle–] through his small orchard...

Interviewer: OK, you are crawling down the slope to the east–

To get away from wind and the heat. The only options I had left, because everything else was on fire around, was to get down as far as I could, but then we hit the fence with the barbed wire. So all I could do was to get both of us down into the lee, which was the lowest point I could get to, and then I just lay on top of him... (in this ditch) here.

Interviewer: So, what I am looking at is two small depressions close to the barbed wire and I would estimate the depressions are no more than 10 centimetres below the slope line of the ground.

BCRC TFI#280DDS, Strathewen

Downwind, down-slope, with wet towels, behind a concrete water tank

We had several attempts at trying to get out, but the embers were just too (fierce)... And eventually we had no choice... The whole house was on fire... The roof – the ceilings were falling in. So, at that stage we (crawled outside and down the slope and) just dived in behind this (concrete) water tank here... We had towels.

Interviewer: So with the winds coming at you from everywhere, how do you manage?

Well, I was sitting there by the tap trying to wet the towels... and then this sheet of corrugated iron blew down off the roof. And it was red hot... And that's what saved us, that bit of tin. It was sitting up because of the wind, and it just directed all the red hot embers away from us.

Interviewer: So, OK, here you are sheltering as best you can with the wet towels–

An hour and a half... and we thought we were the last two people on earth and said our goodbyes, and then we're just sort of sitting there and the wind's stopped just at the same time as we ran out of water.

BCRC TFI#211DDS, Strathewen

What these vignettes suggest is that even under extreme conditions on 7 February, only a small amount of protection can enable survival – quite minimal protection from: (a) smoke, (b) radiant heat, and (c) embers, can make the difference between life and death in a bushfire.

Summary of the main findings

The total numbers of people and vehicles involved in sheltering at the seven locations examined were significant – see Table 1 below.

Table 1: Estimated numbers of people and vehicles involved in sheltering at the locations

Location	People	Vehicles
Marysville: Gallipoli Park	70 approximately	40 approximately
Marysville: CFA shed	8	?
Kinglake: CFA shed	50–100	50+
Kinglake West: Oval	50 approximately	25 approximately
Kinglake West: CFA shed	100–200 approximately	50–60
Kinglake Central: Oval	10 approximately	5
Callignee: Oval	20–25	12–15
Approximate total	300+	200+

The discussion below provides answers to the specific questions posed by CFA at the initiation of the project.

Human behaviour

1. Why did they choose that location? And what were the circumstances that led them to be there?

There was a general awareness among Marysville residents that Gallipoli Park oval was a place of refuge in the event of fire. Some Kinglake West residents believed (incorrectly) that the Kinglake West CFA fire shed and adjoining oval constituted a designated place of refuge. It seems that those who sheltered on Kinglake Central oval did so because their escape route on the Whittlesea-Kinglake Road was blocked and they were aware of the oval as a nearby cleared area where they could park their cars and possibly take shelter in the adjacent primary school. There is no evidence that before 7 February, people thought of the Kinglake or Kinglake West CFA fire sheds as a place of refuge. It seems that most people ended up at a fire shed because they could not think of a safer alternative.

Most of those who sheltered on an oval or in or near a CFA fire shed did so because: (a) they believed that defending their home was not a safe option; (b) they believed that it was no longer safe to attempt to flee because of the proximity of the fire and the danger of being trapped on a road; and (c) taking shelter was the only option left.

2. Did they travel (a) by their own car? (b) By someone else's car? (c) On foot?

All those who sheltered on Gallipoli Park oval, Kinglake West oval, and Kinglake Central oval travelled there by car – either their own, or as a passenger. Most probably, all those who sheltered in or near the Kinglake West CFA fire shed travelled there by car. Some of those who sheltered on the Kinglake West oval (behind the cricket pavilion) had been rescued from their broken-down vehicle(s) by other drivers. While most, if not all, of those who sheltered in or near the Kinglake CFA fire shed travelled in a car, it is possible that some arrived on foot.

3. *How hot did they feel?*

Several civilians who sheltered in a vehicle on Gallipoli Park oval reported that the heat was severe. None of those who sheltered on Kinglake West oval or Kinglake Central oval commented on heat. However, they did report having to move vehicles to escape flames and sources of radiant heat. There were reports that it was uncomfortably hot sheltering in the Kinglake CFA fire shed.

4. *Were they exposed to embers in exposed areas?*

Those sheltering in vehicles on Gallipoli Park oval, Kinglake West oval, and Kinglake Central oval commented on ember showers. Embers were described as large and solid by one interviewee who sheltered on Gallipoli Park oval. Some of those who sheltered in or near the Kinglake CFA fire shed commented on large embers impacting.

5. *Did they seek comfort from others?*

It seems likely that those sheltering at the locations examined (apart from those at Callignee oval, about whose experience there was no information available) were reassured by the presence of others. After the passage of the main fire, emergency services personnel provided care and comfort to those on Gallipoli Park oval.

6. *Did any individuals take a leadership role?*

The only clear evidence of an individual taking a decisive leadership role concerned the Kinglake CFA Brigade Captain who organised the defence of the fire shed and adjoining buildings.

7. *Did they seek out assistance from emergency services?*

There is no evidence that those who sheltered on ovals did so with the expectation that emergency services personnel would be on hand to protect them. Those who sheltered in or near the Kinglake or Kinglake CFA fire sheds ended up there because they could not think of any safer place to go. It would appear that some had an expectation that CFA personnel would be on hand to provide them with some form of protection.

8. *How did they feel when they got to that location?*

The evidence seems to suggest that most of those who took shelter on an oval or in or near a CFA fire shed were fearful about their safety.

9. *What action were they taking during the impact?*

Those on Gallipoli Park oval sheltered passively in vehicles during the passage of the main fire. Those on Kinglake West and Kinglake Central ovals had to move their vehicles to remain safe from flames and radiant heat. Most of those who sheltered in or near the Kinglake CFA fire shed did so passively; a few were involved actively in defence of the shed and surrounding buildings. It seems that those in or near the Kinglake West CFA fire shed sheltered passively.

10. *Did they feel safer than at their home?*

Most civilians interviewed from Gallipoli Park oval and Kinglake CFA fire reported being fearful for their lives. This study has not uncovered any specific material that allows an answer to this question.

11. Were they prepared, i.e. did they have water, food, clothes, etc., to sustain them?

None of those interviewed reported being prepared with food, water, blankets, or extra clothes.

12. How long were they there for and how did they leave?

Those interviewed reported that they spent several hours – for many, up to 12–14 hours – sheltering before it was safe to leave. All, apparently, left in a vehicle.

13. Would they have stayed there even if there were no emergency services personnel there?

None of those interviewed reported travelling to an oval in the expectation that emergency services personnel would be on hand to protect them. It would appear that many who sheltered in or near the Kinglake or Kinglake West CFA fire sheds anticipated that CFA personnel would provide some protection. For most, by the time they arrived, there was probably no opportunity to go elsewhere.

Fire behaviour

1. What can we deduce from the fire behaviour?

In the areas studied, the fires were intense, with FFDIs ranging from 50 to 170. Winds were strong.

2. Could we estimate the radiant heat impact on those sheltering in these locations?

On the ovals, radiant heat flux impacting on vehicles probably is very unlikely to have exceeded 10 kW/m^2 , given that there were no reports of cars being damaged by the heat at an oval. For the fire sheds, the radiant heat flux probably did not exceed 10 kW/m^2 , and is very unlikely to have exceeded 20 kW/m^2 , given that there were no reports of visible damage due to the heat.

3. What were the separation distances between those sheltering and the flames?

On the ovals, separation distances from vegetation probably ranged from 40 to 60 metres. On Kinglake West, Kinglake Central and Callignee ovals, vehicles had to be moved away from sources of radiant heat over time. Separation distances of the fire sheds from significant vegetation were probably about 30 metres. Kinglake CFA fire shed was at risk from embers generated by other structures.

4. What climatic or other factors (e.g. vegetation, wind shift) were present that influenced the radiant heat/ember impact on those sheltering?

The major factors influencing the radiant heat and ember attack on those sheltering at the various locations included: (a) a lengthy period of drought, and high temperatures and little rain in the month preceding the fire; (b) high temperatures, 38 to 46°C; low relative humidities, 5 to 13%, and strong winds, 25 to 60 km/h gusting to 70 km/h, following a south-westerly wind change on the day; and (c) significant tree cover around parts of the ovals, and upwind of the fire sheds. Embers from burning structures posed a threat to those sheltering in and near the Kinglake CFA fire shed.

5. *What was the ember impact on those sheltering?*

The intensity of the ember attack was commented upon for all locations except the Kinglake West CFA fire shed. On Gallipoli Park oval, embers were reported to be of sufficient size and density to damage some vehicles.

Discussion

Perhaps the most significant finding to emerge from this review of the diverse evidence concerning survival during the course of the 7 February 2009 fires is the crucial role played by vehicles as last-resort, movable fire shelters.

In the course of the fire season prior to Saturday 7 February, a number of community safety messages emphasised the dangers of driving through an area affected by fire. Many of those interviewed said that they drove to a nearby place to shelter because they believed that it was too dangerous to attempt to drive to a remote location safe from fire. It is clear from the evidence available that many people who lived through the fires on 7 February owe their survival to their car having served as a mobile temporary fire shelter. Several instances have been cited in the report. More examples are available from the Bushfire CRC Research Taskforce interviews data base, and from other survivors' accounts see, for example:

‘We managed to reach the top of the ridge opposite a large paddock which had just been burned out and we decided to stop here to sit out the firestorm behind us... The wind was incredible, the car was moving sideways across the road—trees on the right hand side of us were exploding... The firestorm passed after what seemed like an eternity...’

Black Saturday, pp. 98–99⁵:

There are several instances described in the Bushfire CRC Research Taskforce interviews of vehicles being driven safely through flames. Reduced visibility due to smoke, however, presented a more serious challenge to drivers, and one of those interviewed was involved in a collision because of reduced visibility due to smoke.

Evidence presented to the Bushfire Royal Commission on 28 May 2009 reported that 11 of the 173 deaths occurred in vehicles and a further five bodies were found near vehicles. This compares with 113 deaths occurring inside a house and a further 27 bodies being found outside a house. It is possible that evidence still to be presented to the Bushfires Royal Commission about fatalities may alter the proposed view of cars being capable of serving as last-resort, ‘plan C or D’, temporary fire shelters (in particular circumstances), but the evidence presented so far is supportive.

Mr Kelleher says, ‘The cars in the driveway were essentially undamaged, and would have provided better refuge than the house. Cars parked in the open are resistant to strong winds and have proved to be quite resistant to ember attack.’ We have already seen from the photos that the blue sedan that has been referred to was largely undamaged by the fire?

—Yes.

That was also the condition of the other vehicle, the one that had the trailer attached that I have asked you about?

—Yes.

04/11/09 (WALKER) HOLLOWOOD XN BY
MR ROZEN, p. 10640

It was not clear at what point the deceased made the decision to leave their vehicle and run to the north. The fact that a large area of trees had been logged nearby may have been a dominant factor in leaving the vehicle and they may have thought it would be a good place to take refuge. Most vehicles, especially on a relatively clear dirt road such as this one, should have been able to withstand the heat and flame of the bushfire until the firefront had passed, especially since there were not too many trees in this immediate area. It may have been a better option for the deceased to take cover inside the vehicle and exit the car once the firefront had passed.

04/11/09 (GORMLEY) HOLLOWOOD XN
(WALLACE-MITCHELL) BY MR ROZEN, p.10682

In relation to ovals and similar being used as places of shelter it must be appreciated that on 7 February 2009, **vehicles** provided the protection from radiant heat and embers for those taking refuge on open spaces.

It seems clear from reports of events at Gallipoli Park oval that the presence of emergency services personnel was important for the care and comfort of survivors after the main fire had passed through. However, two points should be noted: (a) the evidence is that the emergency services personnel provided little, if any, direct defence of those at Gallipoli Park oval; and (b) CFA personnel were not involved in any way with events on the oval at Kinglake West, and were not present at the Kinglake Memorial Reserve oval when the fires came through, yet there were, apparently, no serious injuries resulting from the passage of the fires reported to have occurred at any of these three locations.

During preparation of this report, the risk of a vehicle parked with others on an oval catching fire and fire spreading to the other vehicles was raised frequently in discussion. It should be noted that there is no evidence that any vehicle caught fire at: Gallipoli Park oval, Marysville; Kinglake West oval; or Kinglake Memorial Reserve oval. However, drivers had to move their vehicles around on Kinglake West and Kinglake Central ovals to keep safe from radiant heat generated by burning vegetation. As noted earlier, one car did catch fire outside the National Park Hotel in Kinglake and this fire was extinguished by an off-duty Kinglake West CFA volunteer using his car dry-powder extinguisher. The circumstances of the ignition are not known. It seems likely that the cause was embers from burning structures nearby on the western side of the Whittlesea-Kinglake Road.

In response to an inquiry, Justin Leonard, a CSIRO researcher concerned with building and vehicle fire survivability, offered the following opinion:

Cars parked over any ground fuel that may ignite and burn from embers are at great risk. Otherwise things are pretty safe, leaves and debris do collect in various locations in the car's vents and cavities which may ignite and slowly develop to involve the car; usually this sort of ignition can be attended to and suppressed. If a car does become fully involved, then you need about 8 m separation to prevent spread to other cars and need to be well away from the smoke plume.

Justin Leonard, email communication, 5 November, 2009

It seems that if a vehicle is to provide safe shelter, it should be parked on bare earth or similar, or on very closely mown grass.

Most of those who sheltered on ovals or in or near CFA fire sheds were quite unprepared for what happened. They had no water, food, blankets or spare clothing with them. Most were forced to remain at the location for a considerable time: 3 hours up to 12–14 hours because of the continuing risk of fire and unsafe or blocked roads.

CFA fire station buildings survived the passage of fire and associated ember attack at Marysville, Kinglake, and Kinglake West, while people sheltered safely inside. The shed at Kinglake was actively defended, after some limited preparation; but only by (it seems) three CFA volunteers (including the very experienced Brigade Captain) aided by two civilians. It appears that the shed at Kinglake West did not have to be defended actively, and it is established that the Marysville shed was not defended actively. This would seem to suggest that, in general terms, CFA station sheds are likely to be reasonably resistant to bushfire ignition, presumably because: (a) they typically are of metal-clad construction; and (b) they tend to have a reasonable cleared area around the building so as to allow vehicle access and parking.

The question of CFA fire sheds serving as last resort places of refuge for civilians is obviously very complex and has many problematic issues – as diverse as legal liability for deaths and injuries, and practical requirements for the safe use of fire station facilities during firefighting operations. However, given that the circumstances confronting CFA personnel at the Kinglake and Kinglake West fire stations may well be repeated in future catastrophic bushfire conditions, it seems very important that the agency offers guidance to members to help them make prudent decisions and take appropriate actions.

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