



**Victorian 2009 Bushfire
Research Response**

Final Report

October 2009

INTEGRATIVE STUDIES

Introduction

The overall objective of the Integrative Studies Project is to understand, in a holistic way, the various factors that led to particular outcomes in specific locations affected by the 7 February 2009 bushfires in Victoria. This will be achieved through an understanding of interactions among: (a) fire behaviour; (b) physical features (buildings, terrain and vegetation); and, (c) human behaviour so as to provide an understanding of the integrated factors that contributed to specific impacts (loss of life and/or property) in a spatially defined community. This first study focuses on the Kinglake West (Pheasant Creek) - Pine Ridge Road community. Other Integrated Studies have been carried out for the communities of: Strathewen; Marysville; and Kinglake Central - Reserve Road/Victoria Road. These four areas were selected for study because the extent of loss of life and property damage was disproportionately severe.

In developing these integrative studies senior members of the research team have drawn together the interviews, site inspections and observations to better understand the interplay between the fire behaviour, human behaviour and buildings and the ultimate impact on the community of the area. It should be noted that these reports are necessarily limited in scope because detailed information about the locations and circumstances of fatalities was not available at the time of preparation.

Kinglake West (Pheasant Creek) - Pine Ridge Road

Kinglake West is a small elevated hamlet located at the top of the Great Dividing range, about 65km north-east of Melbourne. It is on the Whittlesea-Kinglake Road, about 5km to the west of Kinglake Central, which is itself located at the intersection of: Whittlesea-Kinglake Road, Healesville-Kinglake Road (Figure 1), and Heidelberg-Kinglake Road. [See Spatial Vision VICMAP Book Map 6449 and page 253; and Melways Map 910 N11]. It is the 'gateway' to that section of the Kinglake National Park which includes the Mount Sugarloaf lookout and the Masons Falls picnic area.

The Community: The somewhat isolated Pine Ridge Road community of about 35 houses and a Macedonian Church is approximately 4km south-east of Kinglake West. Residences are on both sides of Pine Ridge Road, which comes off National Park Road (just outside the entrance to Kinglake National Park (Figure 2)). Based on reports from residents, it appears to be a reasonably closely knit community (which residents described as being located at Pheasant Creek, rather than Kinglake West—both locations have the same Postcode, 3757). There is a large Macedonian Church, and associated sporting oval and community centre, nearby at the western end of National Park Road, adjacent to the Kinglake National Park entrance and office.

According to residents, the composition of households was quite varied. There were some retirees. Other residents worked, locally or away from the area. There were several families with young children and teenagers. One interviewee commented that some residents in Pine Ridge Road were "not well off". The main reason reported for living in the area was enjoyment of the natural environment and being adjacent to the National Park, as well (for residents at the southern end) the spectacular views.

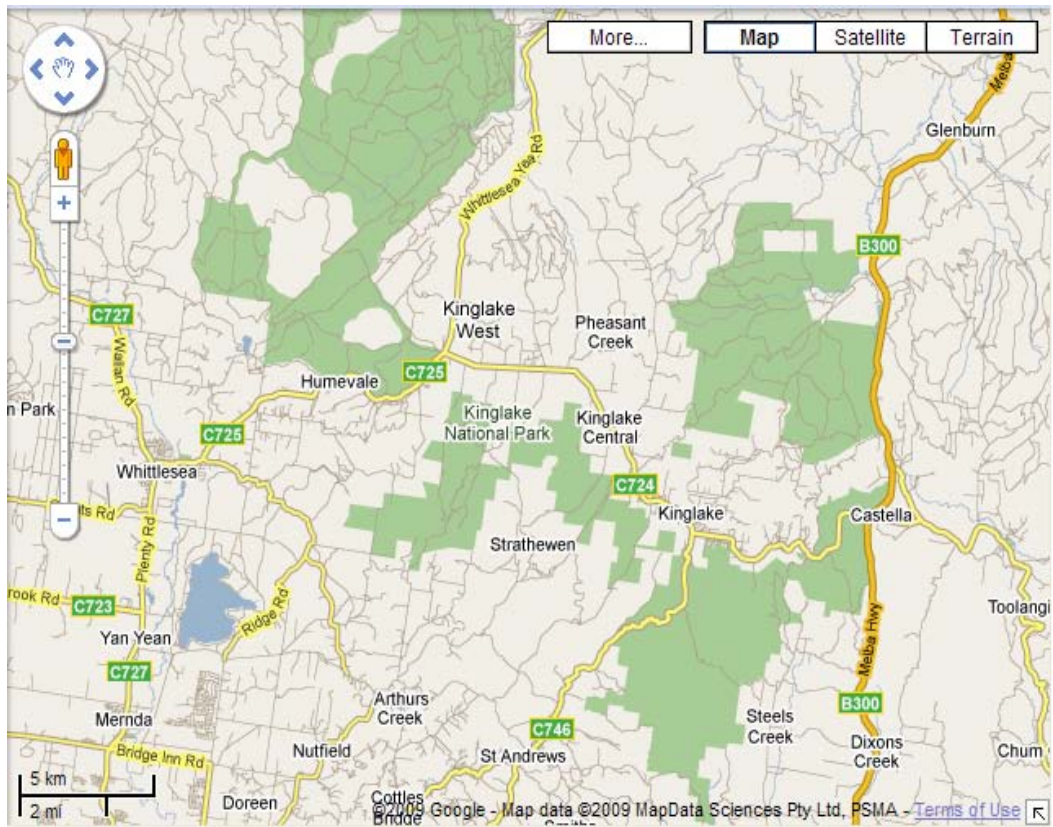


Figure 1 Kinglake West/Pheasant Creek location map

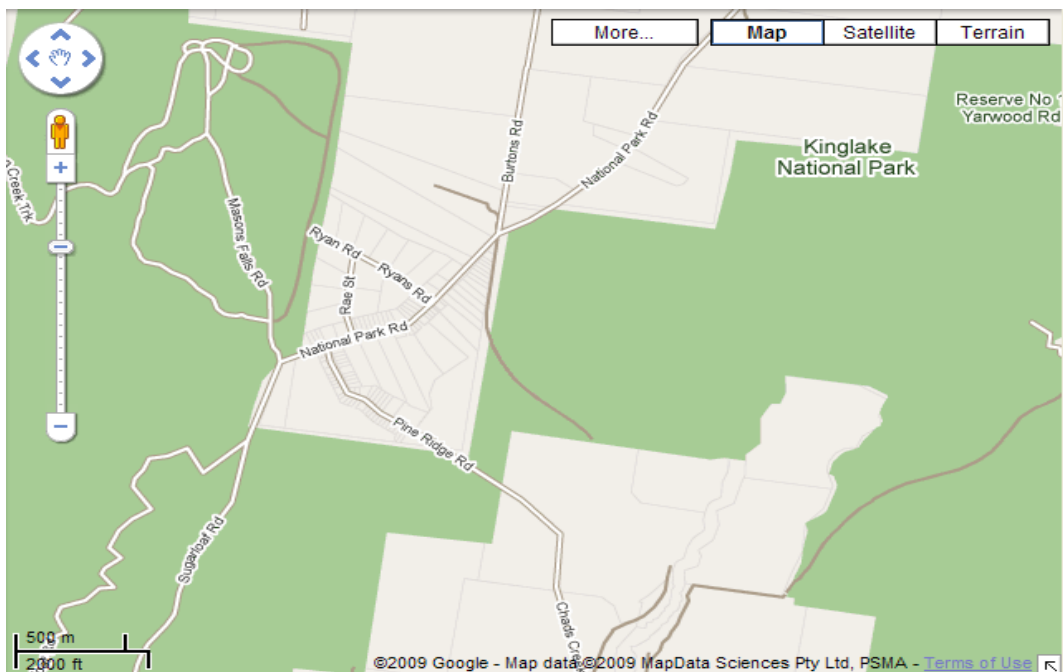


Figure 2 Kinglake West/Pheasant Creek – Pine Ridge Road and surrounding road network

Terrain: The terrain is gently undulating but drops away sharply on the southern edge of the escarpment providing dramatic views to the south. A number of residents took advantage of this setting to build and live along the escarpment (Figure 3).



Figure 3 Looking south-west from the southernmost property in Pine Ridge Road

Vegetation: The area would normally be described as being largely surrounded (except to the north) by temperate eucalypt forest (Figure 4) in the Kinglake National Park. However, several years of drought made the National Park forest very dry. Trees were mostly mature messmate stringy bark eucalypts and there was significant mixed understory. The houses at the southern end of Pine Ridge Road were mostly surrounded by messmate stringy bark eucalypts. There was little or no understory outside the National Park boundaries. In contrast, the north-west end of Pine Ridge Road, near the T-junction with National Park Road, is relatively level, and was lightly wooded with some open areas. The properties near the T-junction have paddocks to the west and north-east (Figure 4 & Figure 5). To the west, in the grounds of the Macedonian Church, there was a double row of mature pine trees (Figure 5). Many houses, particularly in the upper (northern) part of Pine Ridge Road, were surrounded by gardens with lawns, ornamental trees, shrubs and garden plants.

Dwellings: Many houses were of brick construction with iron roofing or tiled roofing. Others were constructed of fibro-cement sheeting, with some brick features, standing on piers. Some were of timber construction. A few were of mud brick construction, with wooden posts and beams.



Figure 4 Pine Ridge Road and surrounds: vegetation before the fire

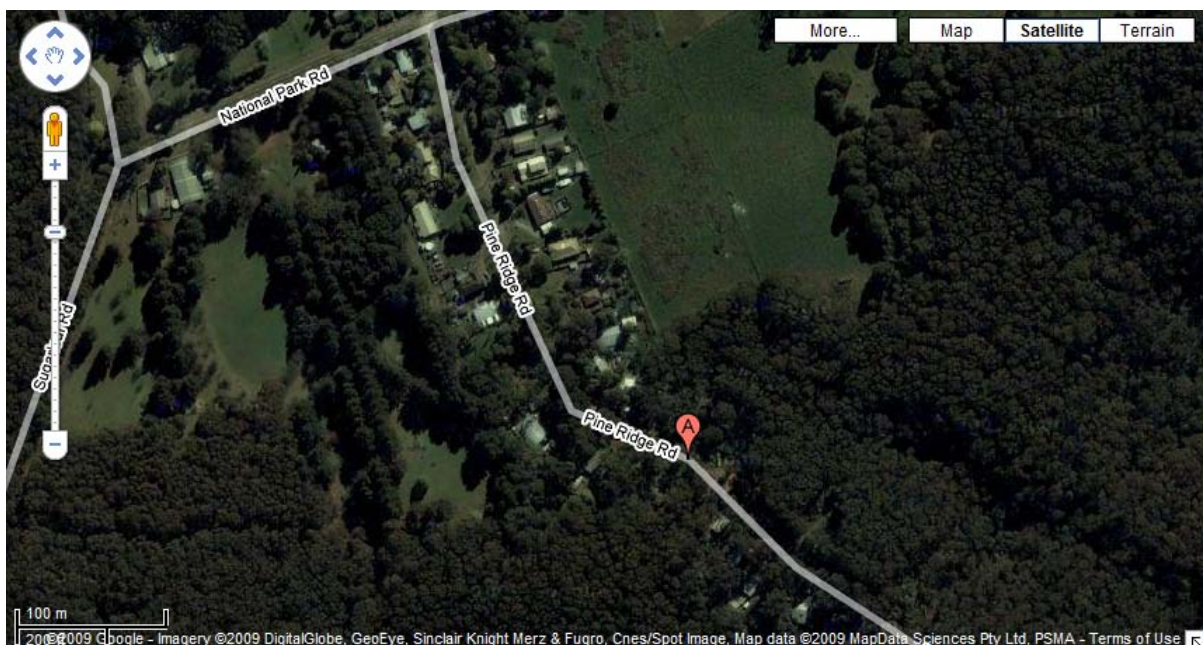


Figure 5 A more detailed view of houses and vegetation around Pine Ridge Road: Note the double row of pine trees to the west, and the oval, in the Macedonian Church grounds.

Fire Behaviour: During most of Saturday 7th February, winds blew strongly from the north-west, pushing the Kilmore Fire towards Kinglake West during the course of the afternoon. A little after 1500, the fire was reported to have reached the Tourourong Reservoir near

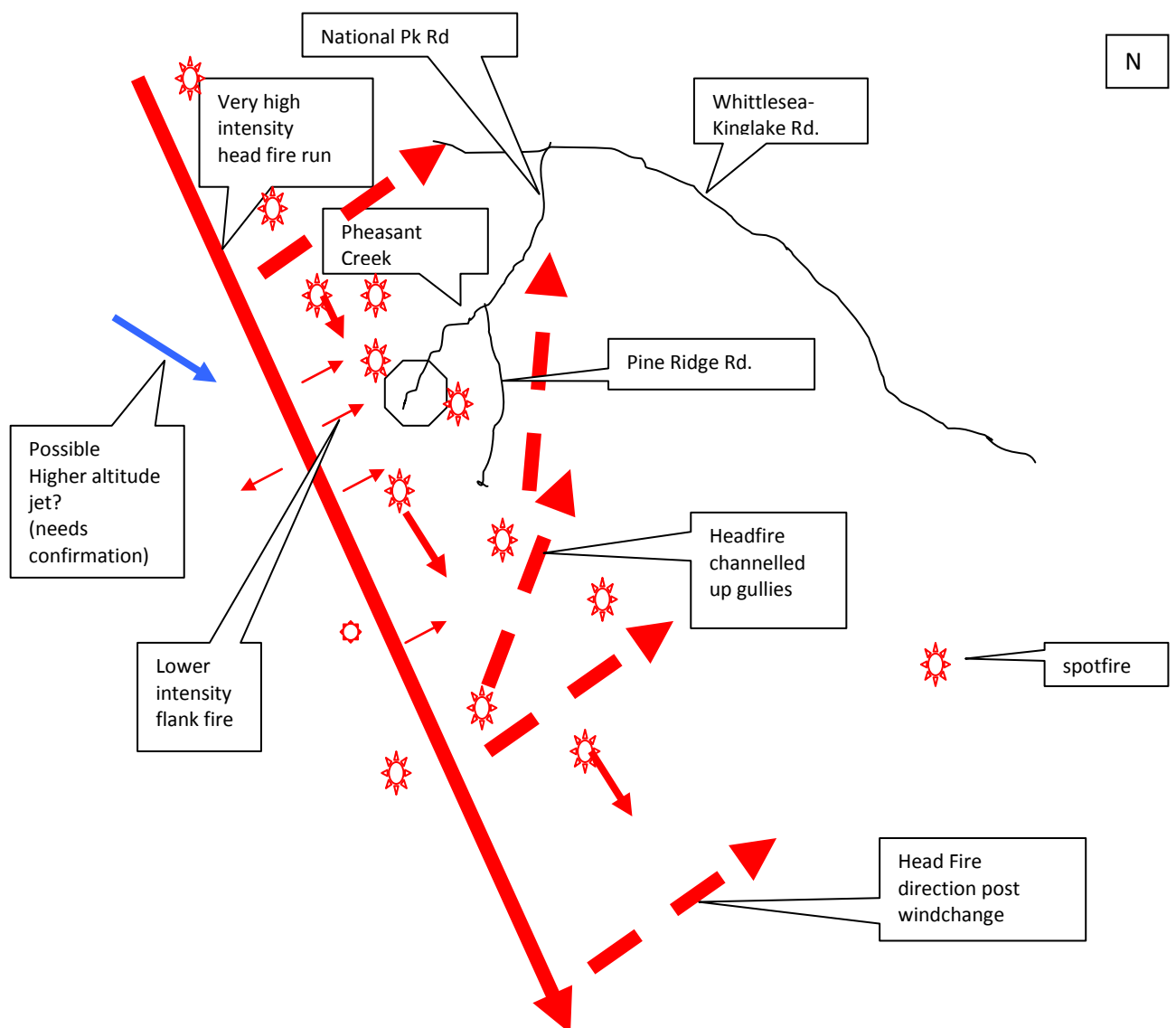
Whittlesea, about 9km to the north-west. About 1530, fire was reported in Coombs Road, Humevale, about 6km to the west of the study area.

Pine Ridge Road residents reported that fire began to impact at about 1700. They reported that fire initially came from the west, or north-west, associated with very strong winds:

Interviewee: When you look out the back and see how the tops of them trees have been ripped off and all that. So, you know, there was a fair bit of force behind that wind, and I think the wind was probably the worst thing of it all.

Very shortly after this, some interviewees reported fire coming from the south, apparently having crossed Mount Sugarloaf Ridge to the west, and then sweeping up gullies from the south, to the escarpment, being pushed by strong winds from the south-west, to impact with great intensity on homes at the bottom (south) end of Pine Ridge Road (see Figure 6).

These observations are broadly supported by the on-the-ground fire behaviour indicators collected as part of this study.



Main Fire

Fire behaviour varied horizontally dependent on slope, fuels, and position on fire perimeter.

Spot fires

Distance and direction of ember travel varied vertically depending on altitude of release from plume.

Fire behaviour varied with time from ignition, initially low intensity, building to high.

Time

Fire behaviour varied with time of day, dropping in intensity after nightfall.

Figure 6 Schematic: Overview of fire behaviour at Kinglake West/Pheasant Creek (based on information provided by wildfire behaviour investigators).

Fire preparedness before February 7

Based on interviews with survivors, there was considerable variation among residents in the amount of preparation undertaken prior to the fire.

- Very few of those interviewed described detailed planning. Most had undertaken some basic preparation:

Interviewer: So were you prepared for the fire season ahead of time...?

Interviewee: Yeah, we were fully aware of what's going on. Our property was well cleared, there was no rubbish or anything around the house.

- It seems that few residents, if any, in the southern part of Pine Ridge Road intended to stay and defend their properties because of: (a) lack of fuel management in the adjoining National Park; (b) failure to maintain the southern access fire trail; and (c) the surrounding trees (Figure 8).
- Very few residents in the upper (northern) part had undertaken extensive preparation to defend their homes, with most having decided that leaving was a better option in the event of direct fire threat:

Interviewee: With just my pumps and that, they're just normal pumps, petrol motors. I also had a sprinkler. I only had a polypipe sprinkler system on my roof...

Interviewer: ...were there sprinklers on any of the other houses in the street?

Interviewee: No, not that I know of. Only people with garden hoses. Yeah, they were just trying to fight it with garden hoses.

Decision making and actions on February 7

From interviews it appears that residents were aware that Saturday was to be an exceptional severe fire risk day.

- Most reported monitoring radio and television for news about fires, all reported that they were aware of the Kilmore Fire.
- All those interviewed spoke critically of the lack of warnings about the approaching fire:

Interviewee: We'd switched over to the ABC and the information we were getting off the radio was very sketchy. There was no mention of Kinglake.

- For many, telephone calls from family members, neighbours, or friends, or verbal warnings from neighbours, were important in alerting them to looming danger:

Interviewee:...and _____ came knocking on everybody's door she said you have three hours to get out...we listened to the ABC. We couldn't hear anything. They were talking about Wandong,

not Coombs Road (--in nearby Humevale--) or anything like that.

- For many of those who left at the last minute, watching other neighbours fleeing was the trigger for departure.
- For some of those who left well before the fire struck, concern about the safety of their children or grandchildren, given the conditions of high temperatures and strong winds, was an important motivating factor.
- Three residents in adjacent houses who endeavoured, unsuccessfully, to defend their homes survived, although one sustained serious burns. As first one, and then the next house ignited, they retreated to the third, and best prepared, house and sheltered until conditions outside were survivable:

Interviewer: So you and _____, and _____ are actively fighting fires at all three properties...?

Interviewee: We were going to but we couldn't. The fire was on either side of the house. We stayed in _____'s house and we were just waiting for it to blow over, but the wind changed and it came back. It was like it sat on us...We think we were in the house for about 15 minutes...Yeah, 10-15 minutes before the house started caving in. Then that was time to go.

- According to family members who were in telephone contact up to the moment of impact of the fire, one resident was determined to defend her property and adhered to this decision in spite of loss of water pressure when power failed about half an hour before the fire arrived.
- There was a great deal of moving around in vehicles before the fire struck and during the course of the fire. Several residents returned to their properties shortly before the fire, and then left again at the last minute. Several of those interviewed reported that a mother and her three children attempted to drive away shortly before the fire, but were advised by CFA personnel to return home because it was unsafe to leave—all four perished. Many of those who fled at the last minute travelled to Kinglake Central and sheltered there, in vehicles or in the CFA shed.

The fire of February 7

As described earlier, fire first struck houses in Pine Ridge Road at about 1700, coming from the north-west, accompanied by strong winds. Shortly after, a second fire came from the south, up the slope of the escarpment, also driven by strong winds. The wind strength was sufficient to snap tops off trees, and to dislodge and scatter sheets of roofing iron.

- The extreme/extraordinary factors on the day were: (a) a lengthy preceding period of very high temperatures and low moisture levels in fuels, including timber building materials; (b) high fuel loads in the surrounding Kinglake National Park; (c) exceptionally low levels of relative humidity; and (d) very high local wind velocities.
- Those interviewed who either fled at the last moment, or attempted unsuccessfully to defend their property but survived, reported: (a) being struck by an ember storm;

(b) seeing very large flames in the crowns of surrounding trees; (c) strong winds coming from different directions; and (d) the loud noise of the fire.

- Several of those interviewed claimed that a decision by National Park staff to deliberately light a back-burn (apparently in a last-minute attempt to protect their lives and Park property) contributed to the level of destruction in Pine Ridge Road.

Outcomes of the fire

All the houses in Pine Ridge Road were destroyed, regardless of whether or not they were defended; and irrespective of method of construction (see Figure 7 & Figure 8). Details of fatalities had not been made available at the time of writing. According to residents, there were several fatalities in houses at the (notionally less vulnerable) north-western end.

The pattern of destructive fire impact on life and property indicates that some likely predictions of building vulnerability, based on current theories and/or models of fire behaviour, may have been inadequate for some dwellings, given the conditions of the day.

- Some of the current parameters concerning defensible space may have been inadequate for several of the properties at the north-west end of Pine Ridge Road.
- Properties at the southern end were not defensible given the conditions of the day, and probably still would not have been defensible in milder weather conditions (Figure 8).

Overall, the critical factors contributing to the severe impact on life and property in Pine Ridge Road were: (a) the preceding extended period of drought; (b) high fuel loads in the surrounding National Park; (c) the extreme fire weather of the day; perhaps, (c) a lack of preparation to defend properties at the north-west end against severe ember attack; and (d) restricted egress.



Figure 7 Pine Ridge Road and surrounds (National Park Road; Ryan-Ryans Road, Rae Street): Property damage resulting from the fire [red = destroyed structure, blue = surviving structure].



Figure 8 Destroyed timber house at the bottom (south) of Pine Ridge Road: looking south toward Strathewen, the Mount Sugarloaf ridge is at the right (west) [note the close proximity of trees].

Understanding and implementation of community safety policy

The level of awareness among residents, in relation to the policy of “prepare, stay, and defend, or leave early” seems to have been quite variable.

- According to those interviewed, many residents from the southern end of Pine Ridge Road did leave well before the impact of the fire. However, other residents did not appear to have a sound understanding of lower-risk options or better versus worse choices in relation to high bushfire danger. Many opted to ‘wait and see”, neither making preparations to defend, nor preparing fully to leave the moment there was any indication of increased danger.
- The overall impression created was that despite a high level of awareness of potential danger among many residents, this awareness failed to translate into decisive action. It appears that there was a general belief that there would be ‘official warnings’ (CFA, radio, websites) well before any fire arrived from communities “up-wind” in the path of the fire: Wandong, Upper Plenty, Glenvale, Whittlesea, Humevale. Several of those interviewed reported an expectation that CFA would warn residents that a fire was approaching. In the absence of such early warnings to serve as triggers, while many residents attempted get more information (making phone calls, driving to vantage points) others simply waited until flames and embers signalled unequivocally the imminent impact of fire.
- Those interviewed were very aware of the dangers posed by the weather conditions on February 7. All reported monitoring the radio, checking CFA and DSE websites, and watching the smoke plume from the approaching fire. Several of those interviewed spoke of general community awareness of the hazard posed by Pine Ridge Road being, effectively, a dead-end because the southern fire access track was impassable to all but four-wheel drive vehicles with full off-road capability.
- A few residents did prepare thoroughly to defend their homes, but others decided to leave at the last minute because they concluded that, owing to the drought, their tank water supply was not likely to be sufficient, given the conditions of the day.
- For several of those who attempted to leave just before the fire struck, a major problem was lack of knowledge about where to go in order to shelter safely. There was confusion about what roads were open and which were closed. There were reports of conflicting information and instructions from CFA personnel to residents attempting to flee their homes.
- While all those interviewed reported keeping their properties clear of fuels, some reported that not all residents did so. An un-mowed grass paddock was mentioned by some, as was the threat posed by the mature pine trees in the Macedonian Church grounds. Several commented on the inevitable risk posed by the vegetation in the National Park.

Kinglake – Reserve Road

Overview of the Kinglake Reserve Road Area

Kinglake is a small (population about 1,100), somewhat isolated, elevated (551m) township located at the top of the Great Dividing range, about 61k north-east of Melbourne. It is located at the intersections of: Whittlesea-Kinglake Road (to the west), Healesville-Kinglake Road (east), and Heidelberg-Kinglake Road (south). Sections of Kinglake National Park lie to the south-east, and south-west.

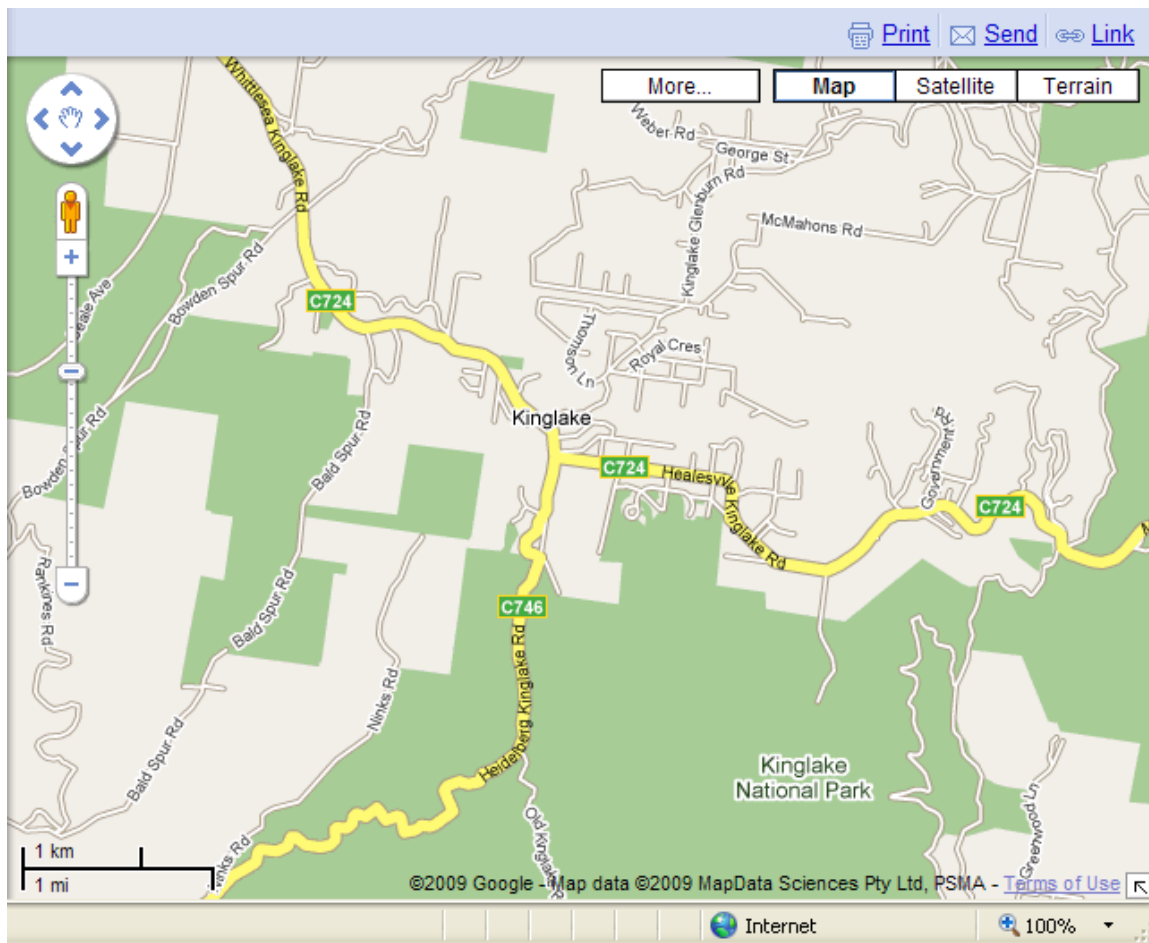


Figure 9 Map of the road network around Kinglake

To the east of the road intersections noted above, there is a triangle of houses along: Healesville-Kinglake Road (east-west), Reserve Road (north-south), and Victoria Road (Figure 10). There about 48 properties in this part of Kinglake. This is the area for this study.

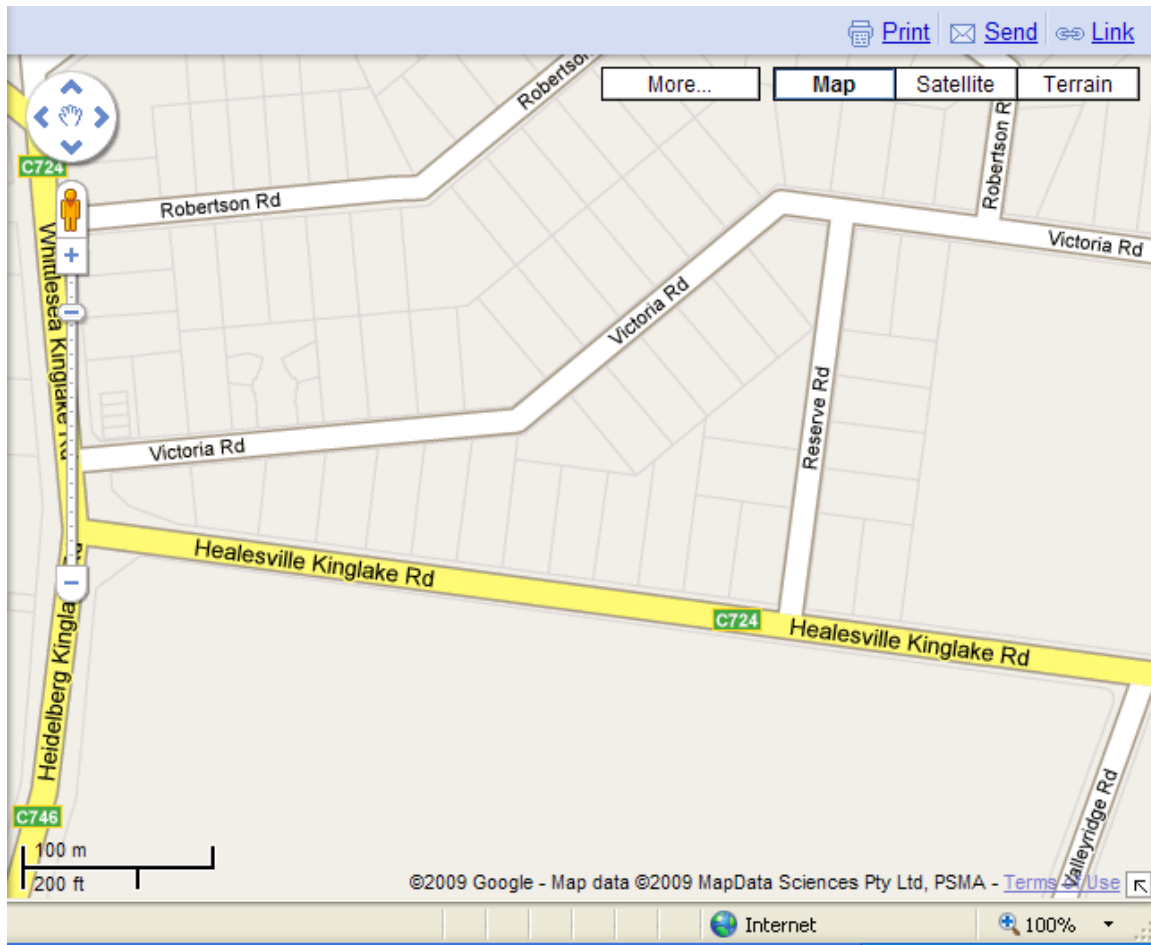


Figure 10 Map showing the area studied

The composition of households in the area varied considerably. There were a few retired couples. There were a few sole occupants. There were a few households comprising two adults. The majority of households however comprised couples with children. It seems that most breadwinners did not work locally. Several of those interviewed were renting.

The terrain is gently undulating. The edge of the escarpment is about 200 m to the south-west of the intersection of Victoria Road and Healesville-Kinglake Road

Vegetation: The area comprises large residential blocks, with numerous mature messmate stringy bark gums on many blocks. Properties had a variety of garden plants, including bushes and small trees—many of European origin. To the south-west, there are thick stands of messmate (Figure 11). To the south, there is a large cleared paddock, which on the day of the fire was grazed stubble. To the south-east, there is mature eucalypt forest, part of the Kinglake National Park.

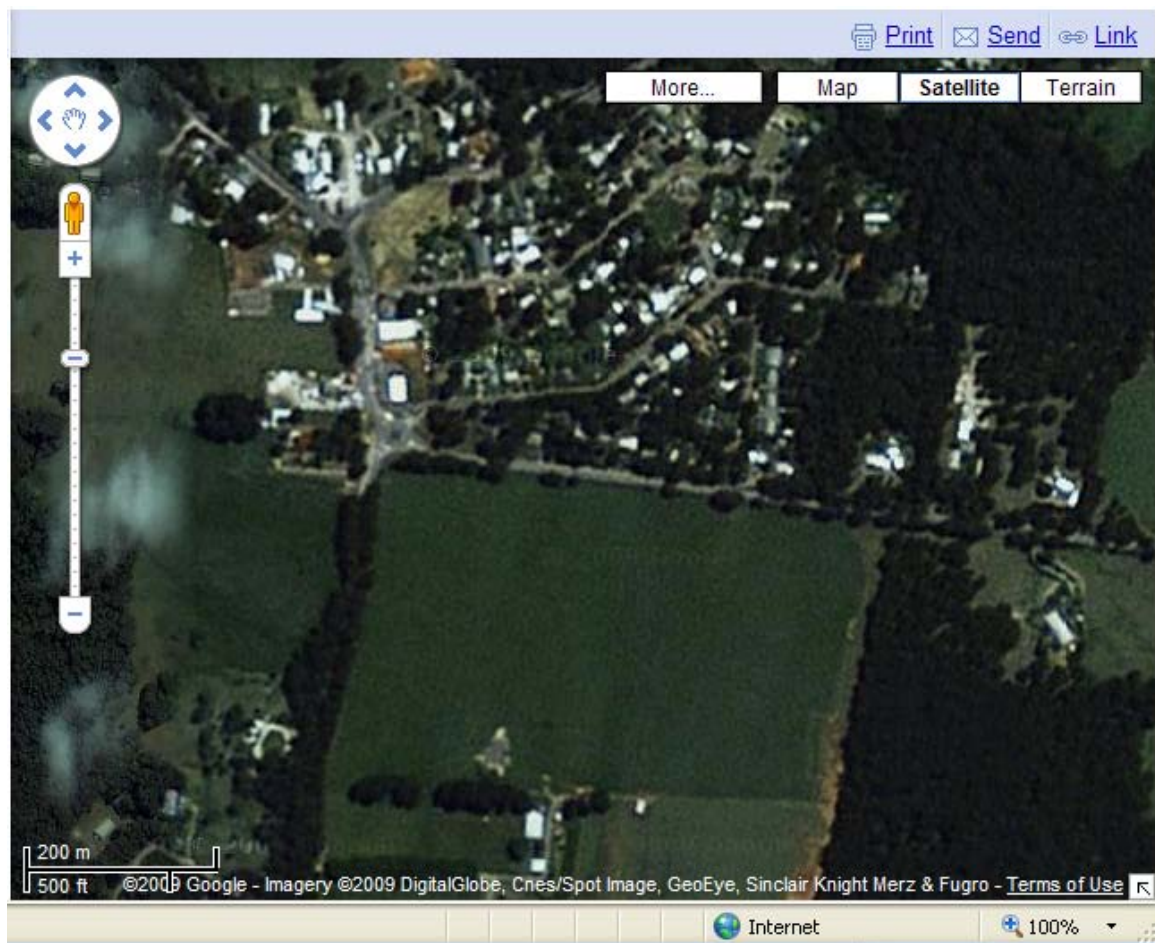


Figure 11 Satellite image of the area before the fire (note the large cleared paddock to the south of Healesville-Kinglake Road)

Fire Behaviour: The fire of the 7th February came from the south-west, having apparently travelled rapidly up the escarpment from the Strathewen area, pushed by strong south-westerly winds. Witness accounts put the time of impact at approximately 1800.

There was no evidence that the fire impacting on this part of Kinglake was especially severe. There does not appear to have been 'crowning' of the fire in trees. There is little indication of scorching of trees or vegetation on the southern edge of the area. Fire damage to vegetation in yards was patchy, and much of this appears to have resulted from burning dwellings. There was no evidence of trees or limbs being brought down by strong winds.

Buildings: The buildings in the area varied greatly in age and construction. Older dwellings were mostly weatherboard, several newer dwellings were brick. Most had metal roofs. There is no evidence that the wind was a significant factor in building damage in this area.

Houses which were destroyed are in large clusters (see Figure 12), and it seems likely that at least some of the houses lost were destroyed by structure-to-structure fire transmission. Fuel on some properties (wood piles, garden furniture, leaf litter, deadfall, grass, garden material) may have also been a contributing factor to house ignition.

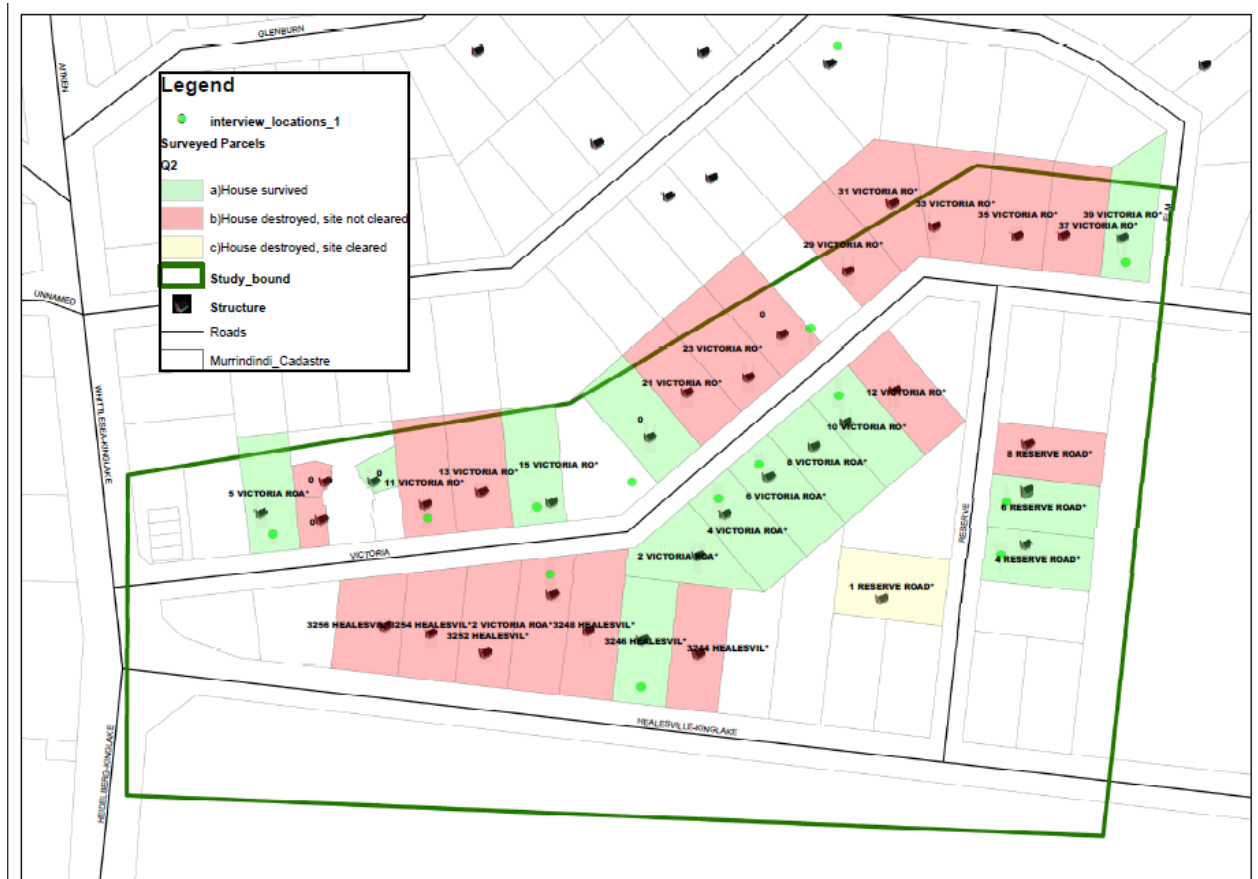


Figure 12 Property Survey of the Study Area

Fire preparedness before February 7

On the basis of reports by those interviewed there was great variation in preparation for a fire prior to February 7.

- None of those interviewed described detailed planning. Several said that they never had any intention of defending their property and intended to leave once warned of a fire.
- One resident had a mobile 9,000L water tank, a 13 Hp petrol driven pump, hoses, and a supply of Class A foam. Others reported that they had not made any preparation. Most residents had water tanks on their property. Several of those interviewed reported possessing petrol driven pumps. Some commented that the drought meant that tank water levels were low.
- None of those interviewed described clearing fuels from their property.
- The overall picture presented is that the level of preparation to protect homes against bushfires was low, and most residents did not believe that their houses were at risk from bushfire.

Decision making and action on February 7

The level of awareness of high fire risk on the part of residents seems to have been very low in relation to the extreme fire weather conditions predicted for the day. Very few of those interviewed had been checking for warnings on the day. The following quotes provide examples of this behaviour.

Interviewer: So were you at home at the time of fire?

Interviewee: Yes, sound asleep, and I got a phone call—

Interviewer: In the afternoon you were asleep?

Interviewee: Yes...Because I'd stayed up all night reading

Interview: Victoria Road

Interviewer: So were you at home at the time of the fire?

Interviewee: No, I was at me mate's around Glenburn Road.

Interviewer: did you ever become aware, you know, that this was about to happen?

Interviewee: We saw the smoke but --

Interviewer: What time would that have been on the day?

Interviewee: Would have been about 5...But we thought it was down Wandong way...And, yeah, we come up - the power went off so we come up to get some ice. We went back, we were going to sit down and watch the footy with the generator and then the smoke come up really thick, and then me mate _____ goes "Geeze, we better take this a bit serious now" and all of a sudden we heard the rumble, and by then we just grabbed the kids, put them in the car and took them to me dad's.

Interview: Victoria Road

On the basis of reports by those interviewed the following observations can be made about decision making on February 7.

- It is not known how many residents had decided to leave their home the day before, or earlier in the day.
- The official warning (ABC radio 774) that Kinglake was to come under ember attack appears to have been broadcast only a short time before the fire impacted (none of those interviewed reporting hearing the warning message). However, the initial impact was not especially intense. Some residents were able to safely leave their property at the last minute, others returned to their property when the fire impacted to retrieve pets and valuables.
- The overall impression given by those interviewed was that, with a few exceptions, residents were quite unprepared mentally for the reality that a fire had struck and were slow to initiate active property defence.

The fire of February 7

The extreme/extraordinary events of the day were: a lengthy preceding period of very high temperatures and low moisture levels in fuels (including timber building materials); and exceptionally low relative humidity.

While those interviewed who were involved in property defence spoke of severe ember attack, they did not describe fire activity or heat being so extreme as to prevent fire fighting endeavours as the following quote shows:

Anyway, so then I came back and started fighting in earnest because we were under extreme ember attack then. Houses at the top of the street were starting to burn. I then recoated the trees with foam, recoated the house with foam, recoated the front and recoated the house. As that was going on I'm also coating around the back. We have got a pile of wood in the backyard and a wood shed. I coated that with foam as well. By the time I had done all of that this house was starting to burn...Then the embers started to really become quite severe and things started to drop here. I hadn't done anything with this and the corner of the top veranda of that house started to burn...So we killed that because it was starting to move in underneath the house. We did a fairly severe bit of work on that and then left it. Then the house around the back started to burn and I was trying to calm the vegetation as far as I could with - because I couldn't get through the fence at the time, otherwise I would have made an attack on the house, but I couldn't. It was a little bit too far away for me and the fence got in the way

Interview: Victoria Road

Several properties are known to have survived the fire without being defended. It seems that the in some cases this may have resulted from green (non-native) vegetation screening the structure from embers. Others survived because of quite minimal defence by neighbours.

Outcomes of the fire

Of the 48 properties in the area, it is understood that 31 (65%) were destroyed or severely damaged. It is also understood that there were five fatalities (including two children) at two properties in the vicinity of Reserve Road ¹.

- It seems unlikely that this pattern of destructive fire impact on life and property occurred because predictions based on current theories and/or models of fire behaviour were exceeded.
- It would appear that most of the properties in the area were potentially defendable under the conditions experienced.
- It appears that a major factor in building survivability was whether or not it was (a) actively defended and (b) a usable water supply was available.
- The large cleared area to the south of properties along Healesville-Kinglake Road would probably have been deemed adequate as defendable space

¹ McGourty, J. (Ed.) (2009). *Black Saturday*. Sydney: HarperCollins Publishers. p. 278

prior to the February 7 fire, nonetheless many of the properties on the north side of Healesville-Kinglake Road were destroyed, presumably by ember attack. As shown in Figure 10, the large clearing to the south extends well beyond 100 meters from properties and would have been regarded as Class One vegetation (low risk)²).

Understanding and implementation of community safety policy

The level of community awareness and preparation, in relation to the policy of 'prepare, stay, and defend or leave early' seems to have been generally low.

- Few residents appear to have understood the high level of risk posed by the predicted fire danger weather conditions. Several residents fled in vehicles at the last minute.
- Some residents had at least a rudimentary understanding of what is involved in defending a property against fire. That is, they had equipped themselves with a water supply, pumps, hoses, and implements for fighting fires. It also appears that some residents underestimated the level of risk posed by the predicted weather conditions and had not ensured that their equipment was in operating condition.
- Individuals did not, generally, perceive the fire danger risk on the day to be exceptionally high. Prior media warnings were not given a great deal of credence. On the day, the weather conditions were not deemed to be extreme.
- At least one resident expected to receive direct advice from authorities that it was time to evacuate:

Interviewer: So, yeah. So, when you - when did you actually decide to leave the house?

Interviewee: Once I'd packed the photos, then me and my brothers were all going to meet up at the one house there. And then, if it did get, if we were told...And then if we were told that it would get serious and that we should leave, like, we were told to evacuate, then we would.

Interviewer: Who would you expect to tell you to leave?

Interviewee: An authority.

Interviewer: Yeah. And do you know who that'd be or how it would come to you, or?

Interviewee: Well, normally it would either be the police would come around, I would think, or somebody.

Interview: Victoria Road

Overall, the preceding extended period of drought, and the extreme fire weather on the day undoubtedly played an important role in the outcomes of the day. However, evidence suggests that other factors contributing to property loss in this area were:

- Lack of preparation before February 7 to reduce fuel loads adjacent to homes.

² CFA (2007). *Building in a wildfire management overlay*. Burwood: Country Fire Authority

- Lack of preparation before February 7 to defend homes effectively in the event of fire.
- Poor understanding of the risks posed by the weather conditions predicted the day.
- The small number of residents involved in active property defence.

Strathewen

Strathewen is a small, rather isolated, rural community some 41 km north-east of Melbourne. The nearest population centre with services, shopping, and a business facility is Hurstbridge, some 16 km south-west. There are about 40 properties in the area, with about 200 residents. There are no major roadways connecting Strathewen directly with major population centres. Local roads are narrow and unsealed. The major sealed road into and out of Strathewen is Cottles Bridge-Strathewen Road, running to the south-west.

In the previous century Strathewen was the centre of considerable agricultural activity: mostly orchards and beef cattle. However, over the last few decades this has declined. There are now only a few working farms, plus some vineyards. Most properties could best be described as hobby farms, several of these support horse breeding and training activities. The 'central' portion of Strathewen consists of smaller-sized properties in and around a broad gully sloping up to the east from the intersection of Cottles Bridge-Strathewen Road and Chadds Creek Road.

Outside this 'central' area there are hobby farms/acreages spread in a broad arc from north-east of the central area round to the south-west, enclosed (roughly) by Eagles Nest Road (west), School Ridge Road (south) and Bald Spur Road (east and north), and extending north along Chadds Creek Road, past where this diverges to the north-east from Pine Ridge Road. Pine Ridge Road climbs steeply (access by 4-wheel drive only) to the Pheasant Creek (Kinglake West) area which was also affected badly by the fires of February 7th. (Figure 12)

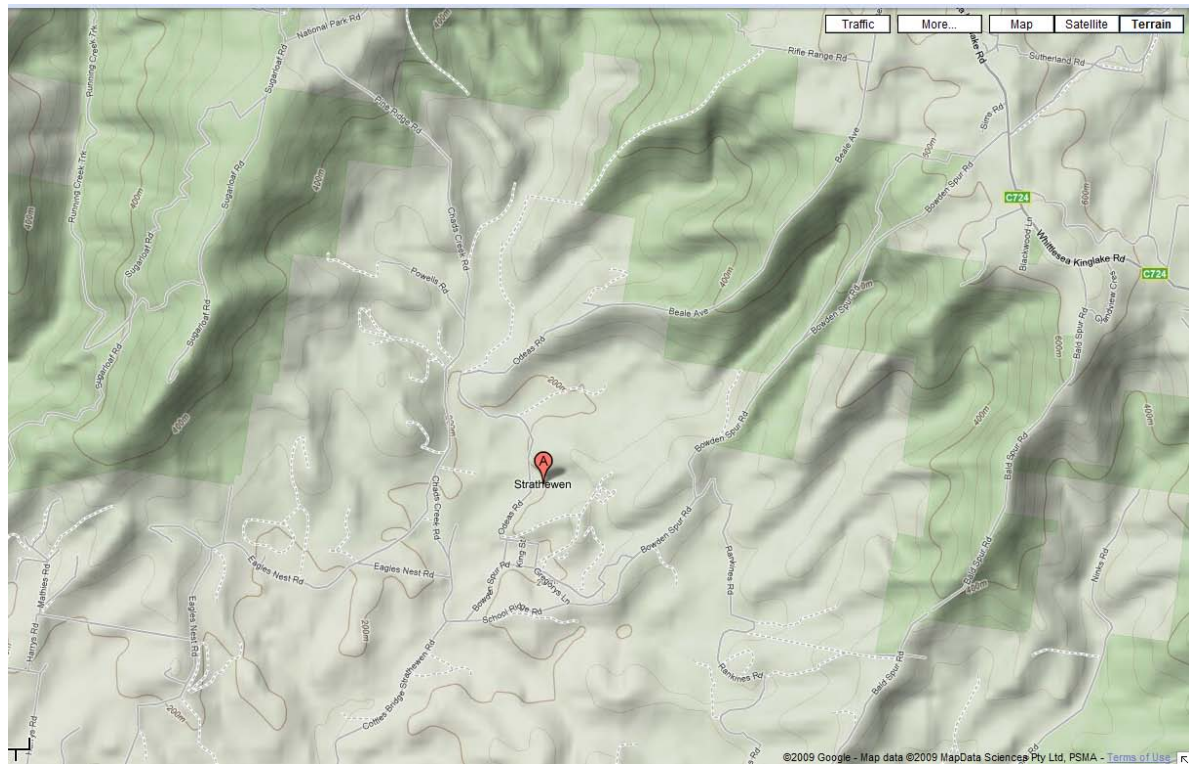


Figure 12 Topography around Strathewen

Data from the 2005 census indicates the composition of residents varied greatly. A small number were retirees, most comprised families with children. Many residents were professionals, who commuted to their place of work. Others worked locally. The

main reason given for living in Strathewen was the natural environment. Anecdotal evidence suggests that there has been little change in this profile in the period since the census although there may have been an increase in the proportion of the population commuting for work and some who are not usually resident in the area (i.e. weekend proprietors/second homes).

The terrain is undulating to moderately steep. The overall slope rises to the east and to the north, rising steeply to the north along Pine Ridge Road to Kinglake West. Gullies tend to drain down to the west, and down to the south from the Kinglake plateau. Around Strathewen, apart from the highest ridges, vision is limited to 1 or 2 km because of ridges and gullies.

Prior to the fires vegetation was mostly unimproved grass cover on the more gently sloping areas, with open eucalypt forest elsewhere, comprising mostly mature messmate stringy bark, box, and manna gums. Scattered casuarinas and native cherry trees, and stands of conifers were on some properties. There was considerable vegetation in the central area of Strathewen. Properties varied greatly in the amount and type of vegetation near to dwellings, few had overhanging trees.



Figure 13 Strathewen

Fire Behaviour: During most of February 7, winds blew strongly from the north-west, pushing the Kilmore Fire towards the Strathewen area in the course of the afternoon. It appears that there was considerable spotting ahead of the advancing 'head' of the Kilmore Fire. A spot fire was extinguished by an Arthurs Creek-Strathewen CFA brigade tanker in the Eagles Nest Road area at about 1530. At about 1610 a resident at 395 Eagles Nest Road made a 000 phone call reporting fire at the property. From this time on, survivors' reports are consistent with the wind having changed direction, blowing strongly from the west to south-west, bringing smoke, embers, and flames. Properties were impacted by embers, flames, and radiant heat over the time period 1610 – 1700, the later times by residents of properties further east (Rankines Road).

These reports are consistent with the on-ground observations of trees with trunks broken off several metres above ground are consistent with wind velocities in the order of 120 km/h. It seems likely that ambient winds combined with convective effects of the fire to generate local extremes of wind intensity and fire activity.

Buildings: There were great variations in the nature of residential properties in the area. Many homes were more than 30 years old. These were mostly: mud brick with wooden posts and beams; fibro-cement sheeting on concrete or wooden piers; or weatherboard on concrete or wooden piers. All had metal roofs. More modern homes were likely to be brick, with metal roofs.

It appears that recently constructed homes (within the last 10 years) were more likely to have survived compared with older buildings. Older homes constructed of fibro-cement sheeting and standing on piers may have been especially vulnerable.

Fire preparedness before February 7

Based on interviews with survivors, and witness testimony to the Bushfires Royal Commission, there was great variability among householders in the amount of advance preparation undertaken prior to the fire.

- There was little evidence of detailed planning. Rather, residents had intentions, of differing degrees of firmness: to stay and defend the property, to wait and see, or in a very few instances, to leave when there was any indication of a likely fire event.
- There was little evidence that those who adopted a 'wait and see' approach were ready to leave immediately following evidence of an imminent fire attack.
- Most residents had made at least some preparation to defend their home. Some had made quite comprehensive preparations, with water tanks, petrol driven pumps, and sprinklers. In many instances, however, these preparations proved inadequate.

Decision making and action on February 7

The level of awareness of fire risk on the part of residents was generally inadequate in relation to the extreme fire weather conditions predicted for the day.

Evidence of a Strathewen resident who appeared before the Bushfires Royal Commission is revealing:

Counsel Assisting: You mentioned in your statement that because people in the area, or at least in Strathewen, didn't receive newspapers, not many people in Strathewen would have come to learn of the Premier's warning about Saturday 7 February?

Witness: That's correct. You see, we live in a different world to you people down here. People live in that particular area to get away from the hustle and bustle of the city...Now, my wife was very simple. She just listened to CDs on the way to work, she never read a newspaper, she didn't watch television news. She was typical of most persons who live in Strathewen, and they would have been taking the same view of what was around them.

The impact of the fire was so sudden and unexpected that, for many, decision making was impulsive: to begin to defend, to seek shelter, or to flee.

- All of those interviewed who attempted to defend their property spoke of: the ferocious wind, the heat intensity, the intensity of the ember storm, and the duration of the extreme heat and ember attack (30 – 60 minutes).
- For those few who decided to leave early, the deciding factors included: being parents of young children, doubt that the home could be defended in light of the drought conditions and lack of confidence in their physical or psychological capability to defend their home. For those who left at the last minute, the deciding factor seemed to be that what they were confronted with far exceeded their prior expectations of a bushfire: wind, heat, embers, noise. For those who stayed and defended, some decided that it was too late to flee and thus they had no option, others were always determined to defend their property and believed that their preparations would enable a successful defence.
- Some decisions to leave at the last moment were influenced by seeing others fleeing at the last moment.

The fire of February 7

- The extreme/extraordinary events were: exceptionally low relative humidity, a lengthy preceding period of very high temperatures and low moisture levels in fuels (including timber building materials); and very high local wind velocities.
- All of those interviewed who defended their property (successfully or unsuccessfully) reported that elements of their defence failed: electric power was lost, petrol-driven pump motors stopped when petrol vaporised, plastic pipes and fittings melted, building integrity failed, physical exhaustion impaired activity. Almost all reported a moment of psychological crisis when they had to muster their mental resources, by an act of will control their negative thoughts and emotions, and renew their defensive endeavours.

Outcomes of the fire

Within the central area of the Strathewen community and immediate surrounds, there were 27 fatalities, that is, about 14% of the residents.

There was extensive destruction of buildings; about 80% of homes were destroyed. Overall, more than half the dwellings in the Strathewen area were destroyed or severely damaged. The local school was destroyed.

This pattern of destructive fire impact on life and property probably exceeded some likely predictions based on current theories and/or models.

- Many of the properties were not defensible under the conditions experienced. It appears that a major factor was the location of a property. If a dwelling was on a flat area, or on a slope facing south-west to north-east, and thus exposed to the full impact of the fire, it was unlikely to survive—regardless of the nature of the building, the preparations, the defensible space, or the actions of occupants. In contrast, dwellings protected by ridge lines to their west were likely to survive, in spite of nearby fuels.

- Some of the current parameters concerning defensible space were probably inadequate in the context of fire behaviour on Saturday 7th February in the Strathewen area. Many of the properties surveyed had defensible space which would probably have been deemed adequate prior to the 7th February fire, nonetheless these properties were destroyed.

Overall, the critical factors contributing to the severe impact on life and property related to: the preceding extended period of drought, and the extreme fire danger weather on the day.

Understanding and implementation of community safety policy

The level of community awareness and preparation, in relation to the prevailing policy of 'leave early or prepare, stay, and defend' seems to have been generally low.

- It appears that, overall, many householders did not have a sound understanding of lower-risk options or better versus worse actions in relation to a bushfire: few left the area the day before or early on Saturday. Few residents appear to have understood the high level of risk posed by the predicted fire danger weather conditions. Many residents attempted to flee in vehicles at the last minute, several perished. Local roads are narrow, in many locations too narrow for vehicles to pass, with tree-lined verges. The strong winds brought down trees and blocked roads, preventing escape in vehicles and hampering access to the area after the fire.
- It appears that most residents had at least a rudimentary understanding of what is involved in defending a property against fire. That is, they had equipped themselves with a water supply, pumps, hoses, and implements for fighting fires. It also appears that all underestimated the severity of the impact of the fire or the demands that this would place on those attempting to defend their property.
- Some of those residents interviewed were, or had been, CFA volunteers and it is likely that their training contributed to their survival. None of those interviewed referred explicitly to community organizations such as the local fire guard/phone tree group. It is understood that a fire guard group was established in 1996 and had 30 members. There is no evidence that it was especially active prior to the events of 7 February.
- Individuals did not, generally, perceive the fire danger risk to be exceptionally high. Media warnings were not given a great deal of credence. On the day, the weather conditions were not deemed to be extreme.
- While many residents interviewed reported prior experience with fires, these were small and in no way prepared them for the events of Saturday 7th February. One resident claimed that the last serious fire in the area occurred in 1962—a fuel reduction burn on a property that 'got away'. A few residents reported that they had been concerned in February 2006 by threats posed by a fire burning to the north of Kinglake. They contrasted the warnings to communities associated with that fire with the lack warnings concerning the 7th February fire.
- There was no information broadcast on radio 774 concerning Strathewen, nor was there mention on the CFA and DSE web sites, before the fire impacted. The fire impacted so rapidly that residents had no time to seek more information beyond what they could see, hear, smell, and feel.

Marysville

Introduction

The aim of this study is to contribute to an understanding of the events that led to the significant losses, in particular loss of life, which occurred in the Black Saturday bushfires in Marysville on February 7th 2009. The guiding questions to be addressed are set out in the Bushfire CRC 'Integrative Studies research outline'.

This report is based on data collected by the Bushfire CRC Research Taskforce (the Taskforce). The main source of data is 30 qualitative interviews conducted with residents and business owners in Marysville.

Limitations

It is important to recognize the limitations of this report to fully address the questions, as set out in the Bushfire CRC 'Integrative Studies research outline'. At the time of writing, data available to the researchers was limited to that collected by the Bushfire CRC Research Taskforce. Although this information is comprehensive within the scope of the Taskforce objectives, key elements which are missing are the locations and circumstances surrounding the 34 fatalities, maps showing the fire spread and perimeter and official details of action undertaken by the fire and emergency services, in particular the Victorian Police, CFA, DSE and SES.

Study Area: Marysville

Marysville is a small Victorian town located 100 kilometres north west of Melbourne (see Figure 14) in the Shire of Murrindindi. The nearest rural centres are Healesville, located 34 kilometres south east, Alexandra, located 41 kilometres to the north and Warburton, located 45 kilometres to the south. Road access to Marysville is via three sealed roads: Marysville-Buxton Rd, Marysville Rd and the Marysville-Woods Point Rd (Figure 15).



Figure 14 Location of Marysville (Google Earth, 2009)

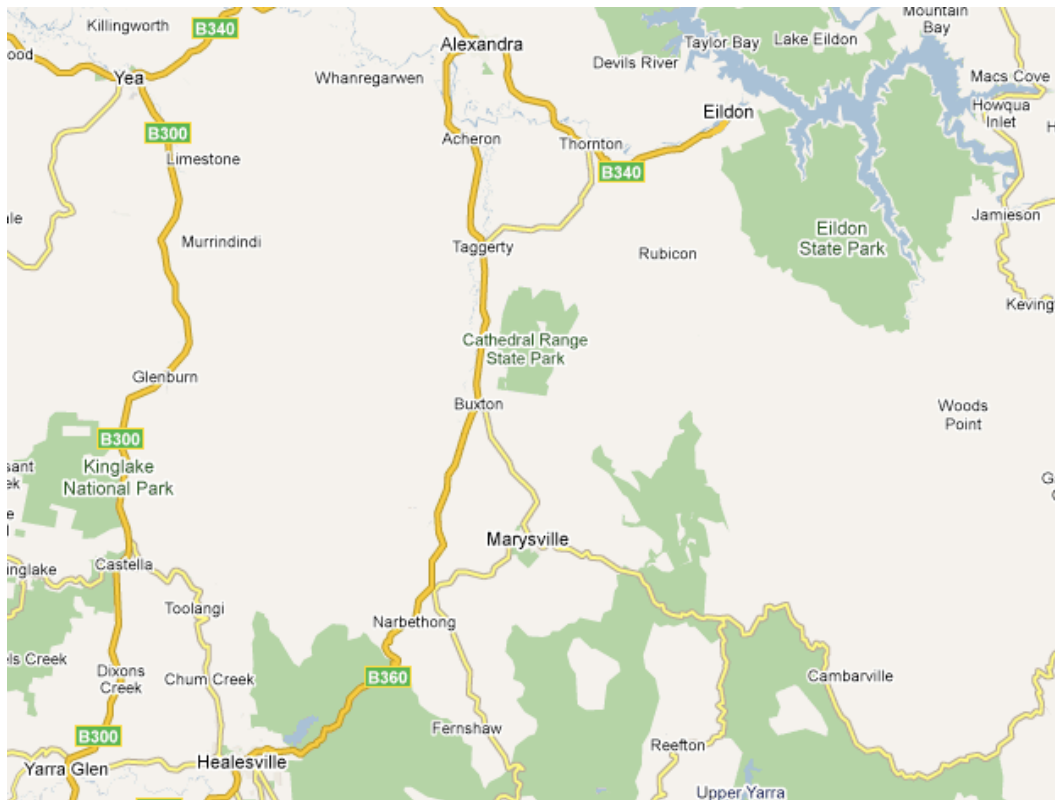


Figure 15 Marysville road access and location to nearest population centres (Google Maps, 2009)

Population

The 2006 Census (ABS, 2008) recorded Marysville as the usual place of residence for 519 people. The age distribution of this population is shown in Figure 16.

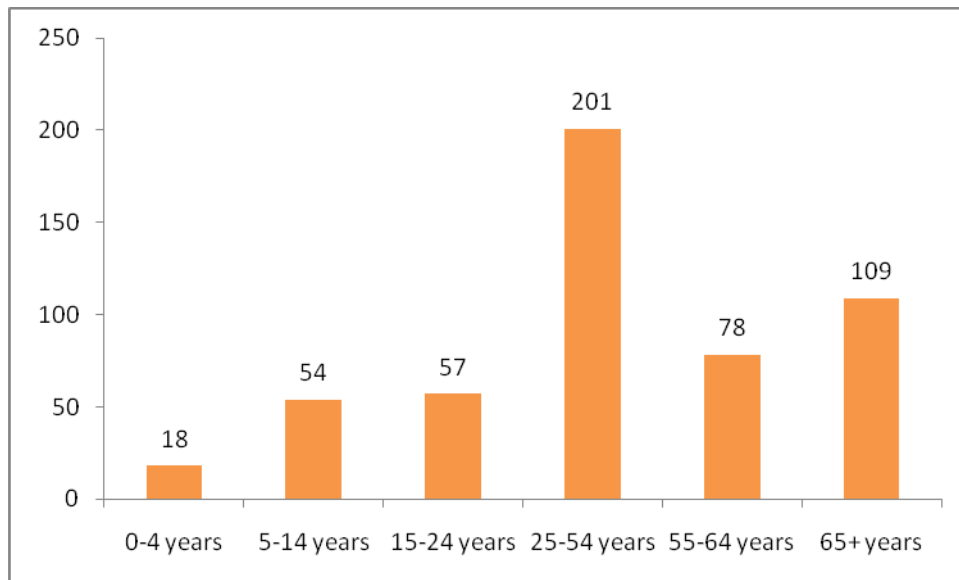


Figure 16 Age distribution of Marysville population (ABS, 2006)

Marysville was a popular tourist destination and employment statistics reflect this, showing most Marysville residents are employed in tourism supporting industries, such as accommodation (35.8%), and cafes, restaurants and takeaway food services (5.1%) (ABS, 2008). Other industries include building services (3.5%), Log Sawmilling and Timber Dressing 3.1% and Postal and Courier Pick-up and Delivery Services 2.8% (ABS, 2008).

The 2006 Census (ABS, 2008) recorded 385 private dwellings (includes houses, units, terraces etc) in Marysville. In these dwellings lived 147 family households, 57 lone person households and 9 group person households.

Topography

Marysville lies in the foothills of the Great Dividing Range and has a complex surrounding topography. It consists of broad valleys to the northwest rising to the sub-alpine peak of Lake Mountain to the east. In this position, Marysville is surrounded by numerous valleys and hills which would strongly influence wind direction and local fire behaviour. This is evidenced by numerous descriptions of multiple directions of fire approach.

Vegetation

The vegetation surrounding Marysville is variable with grasslands in the valleys, used for grazing and agricultural production, through to tall wet eucalypt forest (*E. regnans*, *E. viminalis*) in deep gullies, open dry eucalyptus forest (*E. obliqua*, *E. dives*) on hillsides, to sub-alpine woodlands and heath lands at higher altitudes. In addition there were numerous *pinus radiata* plantations.

Within the town boundaries the vegetation changes rapidly to predominantly cultivated gardens. Street trees are mostly exotic species.

February 7th 2009

Marysville was within the boundary of the fire referred to as the Yea-Murrindindi Complex. This fire initially spread SE from the point of origin near Murrindindi towards Healesville. The fire was narrow; with its eastern flank somewhere between the Murrindindi River and Black Range Rd. Evidence of spotting and north east spread near Bull Creek Rd suggest this was as far as the fire progressed in this direction before the wind change. After the wind change the fire spread north east towards Marysville and the Goulburn Valley highway. Near the southern edge fire behaviour was moderate, e.g. <1 m flame height in pine plantation west of Maroondah Hwy-Marysville Rd intersection.

Fire behaviour in most of the fire area was intense (full crown scorch or defoliation); intensity patterns followed the terrain and wind direction (e.g. more intense windward/upslope, less intense leeward/downslope). Spread observations along the Maroondah Hwy showed NE spread across the highway. An interesting exception was a length of 1 km along the highway near Marysville Rd showed SE spread, indicating long distance spotting. No observations were made east of the Maroondah Hwy due to road closures.

Summary

- Interviewees were aware of the expected weather conditions.
- This awareness did not necessarily translate to awareness of fire risk in Marysville.
- Many interviewees felt the risk of fire in Marysville was low due to its location and lack of fire history.
- The weather on the day, although very hot, was clear and for much of the day, not very windy.
- Most interviewees saw the smoke from the Murrindindi Mill fire, but most didn't recognise it as smoke; or thought it was smoke from the Bunyip or Kilmore fires; or didn't feel the fire posed a significant threat to Marysville.
- Information on the fire, its progress and predicted path, was very difficult to obtain.
- Once residents realised Marysville may be impacted by the fire, most began preparing to stay and defend.
- Most warnings interviewees received of the impending fire were informal, from neighbours, friends or members of SES, CFA or DSE.
- Expectations of a fire in Marysville were for a small and easily manageable fire.
- Most interviewees abandoned their plans to stay and defend on advise (by neighbours, friends and emergency services) to leave or on seeing flames on the nearby hills.
- Most interviewees went to Gallipoli Park, which became a refuge point.
- Driving conditions for a convoy leaving Marysville to Alexander were poor, with low visibility due to smoke and high winds.
- Residents who arrived at Gallipoli Park after the convoy had left were unable to leave due to deteriorating conditions (high wind, fallen trees) and thus stayed at the oval overnight.
- A small number of interviewees successfully stayed and defended. Their levels of preparedness varied, but were generally high.

Perceptions of bushfire risk

Most interviewees knew of the weather predictions for the day, and many had also heard there was an extreme fire danger warning, however many did not believe a fire would actually impact them. Many interviewees referred to the lack of fire in Marysville in the past and to other fire events, such as the 1939 fires, where the fire burnt from Narbethong to Buxton, but missed Marysville (Fahy, 2003).

“I remember being absolutely amazed about the temperature, what they were predicting the temperature to be, but I don’t think I’d put two and two together and said that is a potential for bushfire.”

“...we’ve been here 20 years and there have been a lot of bad days and there have been fires and no, we didn’t plan for a fire. We knew what we’d do if there was a fire, but we would never, had never thought, or never planned (that) today, tomorrow there might be a fire.”

“...no one expected it, it’s always gone past Marysville for the last hundred years...always missed and everyone was getting a bit complacent, thinking that it would never come in here ‘cause we’re supposed to be in some good valley...”

Finding out there is a fire

All interviewees saw smoke from the Murrindindi fire, often not long after the fire had started (3pm onwards). Interviewees had a variety of reactions to seeing the smoke, some not recognising it as smoke, thinking it was a cold front or a large cloud or thinking it was smoke from the Kilmore or Bunyip fires and therefore posed no threat. For others, the sight of smoke was impetus to seek further information, from either formal (DSE/CFA website) or informal (speaking to neighbours and friends) sources and it also prompted many to enact their fire plan.

Information flow

Following confirmation the fire was at Murrindindi, many interviewees believed because of the distance to Murrindindi (approx 30km), the danger of the fire impacting Marysville was low and if it did reach Marysville it would take many hours to travel the distance.

Information about the fires appears to have been difficult to obtain, particularly from formal sources. DSE/CFA websites were hard to access due to the high demand and interviewees noted that once they were on the sites there was no indication the fire would impact Marysville. Interviewees who used the websites found them lacking in relevant information and many commented the information did not seem to be up to date, as they looked at it over many hours and the size and status of the fire appeared not to change.

“...they had a laptop with the CFA website on it and the fire was at Murrindindi and it was staying at Murrindindi and it wasn’t moving”

Some residents were tuned into ABC Radio 774 and others were listening to the local radio station, UGFM. Some commented they heard the fire at Murrindindi reported by the ABC 774 and UGFM, but that there was little reference to Marysville. One interviewee stated information on the ABC 774 was that the fire was small.

At approximately 17:15 (Four Corners, 2009) the power to Marysville went out, thus residents lost access to the internet and radio, and where they did not have a fixed line or mobile telephone, also lost telephone contact. Most interviewees had not anticipated a loss of power and thus did not have alternative resources, such as a battery powered radio. Mobile reception, particularly with Telstra, appears to have been maintained throughout and several interviewees spoke to friends and family outside the fire affected areas to gain information on the status of the fire. Again, many interviewees commented the websites were not kept up to date and there was little information on ABC 774 and therefore despite seeking information from outside the fire area, there was still no indication the fire was heading towards Marysville.

A key information source for interviewees were friends, family and neighbours, particularly in regard to warnings that the fire was impending and advice to evacuate to Gallipoli Park.

The most significant indication the fire was going to impact Marysville were the visual cues, seeing smoke and flames. Many interviewees did not realise the fire was impending until the area was engulfed in smoke or they saw flames on the surrounding hills. This meant the real threat, the size and speed of the bushfire, was not realised by many until moments before the fire impacted Marysville.

Planning and preparation

The level of planning and preparation for a bushfire event varied markedly among interviewees. Generally, there was a low level of preparation and this can probably be attributed to the general feeling that Marysville was safe from bushfire. Where there was preparation, it was often minimal and in line with normal maintenance of a property, such as mowing, clearing debris and cleaning gutters.

“Well we did get information a few weeks prior that it was going to be a really bad fire season okay. And we are guilty to it, we weren’t prepared for it. We didn’t actually take any notice of it to be honest, we didn’t you know. And that’s what I said to ____ the other day. We really didn’t – it won’t happen to us. It’s like an accident, when you’re driving, it’s not going to happen to us, it always happens to someone else. So we honestly weren’t prepared.”

“...and all this talk about putting our fire plan into action, well to be quite truthful, we didn’t have one”

Interviewee 1: “We didn’t have a fire plan”

Interviewee 2: “You just don’t even think about it”

Interviewee 1: “We’ve never thought about it. I mean whilst the CFA say quite regularly you should have a fire plan, you sort of think we live in the middle of town. And our location...we were probably 200 metres from the bush.”

A small number of residents were very well prepared, and in most cases they successfully stayed and defended. These people generally all had some kind of previous bushfire experience (for example, were members of the CFA) or had attended CFA community meetings. These residents tended to have a realistic expectation of the fire risk, of what would occur during a fire, and were confident in what they were doing.

“I’ve prepared over a number of years really. I’ve had this tank and the setup I’ve got, the system I’ve got has been here for quite some time. Two years ago we had a fire meeting, where a member of the CFA came and gave us a lecture at one of the homes in *[interviewees street]*. We discussed the situation because we’ve other bad years. We walked all the houses down in the court, probably about half a dozen homes.”

These people were also less reliant on personal warnings, taking the weather conditions and predictions of extreme fire weather as enough to prompt being ready for a fire, including monitoring the environment for signs of smoke. The following is a couple that had made significant house preparations and subsequently successfully stayed and defended their property.

“...most of this was at the suggestion of the CFA which, two years ago I think, it might have been three years ago, at the instigation of our then counsellor, _____, the CFA visited the village and offered people training sessions, first of all, with a general briefing, in the Village Hall with smaller briefings in people’s homes and then if you wanted they would come to your house and do an on the spot inspection and assessment of your vulnerabilities and advise you on how you could deal with those.

“We were one of the few families in the visit that availed ourselves of all of that and we took them at gospel. So we went out and bought all this kit. We bought the right clothes and so forth. We had our bags packed, we had a big ski bag packed with the sort of stuff that we would need.

“At the beginning of each summer, we also take down all our precious stuff. It amounts to a whole car load’s worth of irreplaceable documents and photographs and all this sort of thing which we store in our daughter’s flat in Southbank. So, basically, this is our drill at the beginning of summer, you go through certain procedures. You keep the environment of your house free of debris and all that sort of thing that the CFA told you about. It’s just simple defensive preparations.”

This resident goes on to describe the general feeling in Marysville is that bushfire is unlikely to impact the town because of its location (being in a valley) and the lack of fire impacting the town in the past. The resident commented that other residents had felt the high level of preparation was unnecessary. This appears to be an accurate assessment as represented by the lack of bushfire risk awareness and lack of planning or preparedness.

Intentions – Stay and Defend or Leave Early

Table 1 shows the intended action of interviewees in a bushfire situation. Although people's intentions were intended to reflect what they were planning to do before this fire event, it is likely their experience in this fire has influenced their response to reflect what they did do.

Intention	Number
Stay and defend	17
Leave early	6
No plan	5
No plan specified	1
Not applicable	1

Table 1 Intended actions in a bushfire

Despite believing Marysville had a low risk of being impacted by a bushfire and a generally low level of preparedness for such an event, most (17) of the interviewees were intending to stay and defend. In many cases, staying and defending was dependant on the size of the fire, with many qualifying their intention to stay and defend with conditions for what type of fire they would stay or that they would stay until embers stated, but anything more than embers would prompt them to leave.

None of the interviewees intending to leave early (6) specified what the trigger would be to leave. Nor did they know where they would go.

Warnings and Evacuations

Despite most interviewees stating they received no official warning and little time to prepare for the onset of the fire, there seems to be some areas where there was awareness of the impending danger, resulting in the evacuation of some residents from Marysville.

The SES had a list of vulnerable people in the town and volunteers were involved in moving them out of Marysville (to Alexandra).

A DSE employee was also involved in advising people to leave, although it unclear from the interviews whether she undertook this as part of her role at DSE or of her own initiative. Several interviewees living in the Falls Rd and Lyell St areas were advised by this DSE employee to go to the Cumberland Hotel. On this advice the residents went to the Cumberland Hotel, only to find it unoccupied. They then made their way to Gallipoli Park.

All interviewees stated they spoke to friends, family or neighbours and this was often their prime source of information. Most often this was how word travelled that Gallipoli Park was the evacuation point.

Tourists

Fortunately due to the extended hot weather there were fewer tourists than usual in Marysville on the day of the 7th February. There were, however, tourists in town, some day visitors and some staying in accommodation.

“I said, well I’m going to get out, I think it’s wise you do. I went down to the main road and there were tourists walking up and down the main road eating ice cream”

This created difficulties for accommodation providers and sometimes, just residents in general. It appears most tourists did not realise the fire risk nor did they know how to react to the threat of fire. There were a variety of responses, from tourists leaving early in the day, before the fire at Murrindindi had even begun, to others who wanted to stay and help the accommodation owners stay and defend.

“There was 80 people or something from Marylands (Country House) that didn’t have a bus. The bus had gone back to Melbourne to pick up more guests. And they were stuck down there, they had no transport or nothing, and everyone’s putting them in vans and Winnebago’s. If there’s a spare seat in your car – all that kind of shit. I think one guy even put one in the boot. I mean, they had to, there was no transport.”

Fire behavior

The impact on Marysville occurred after the wind change, causing the fire to spread north east towards Marysville. Fire behaviour indicators in and around Marysville were predominantly for south westerly winds, although some examples of fire spread direction were apparently terrain dominated.

The fire behaviour was generally within the scope of the current fire behaviour models when their known limitations are taken into account (such as rate of spread being influenced by heavy short distance spotting). However, interviews with residents suggest the fire behaviour observed by residents was beyond their expectations and may have played a pivotal role in their decision making and subsequent actions.

As already stated, many residents did not think Marysville would be impacted by fire due to its location and fire history. Many interviewees also thought that if a fire did come to Marysville it would be small and ‘manageable’. This perception appears to again stem from the location and fire history of the area, but also came from what their expectations of a bushfire were. Overall, it appears this fire was much bigger, faster and ferocious than interviewees expected.

“So we decided to try and get out through Granton, and go down the hill towards Granton and the fire was already spotting, and spotting, I think people sort of hear the word spotting and think they’re little spot fires, but they were the size of buildings.”

“I wasn’t expecting what happened. I was expecting some fires and stuff but I didn’t think there’d be any problems at all, actually.”

“This was more than a bushfire, this was a fire storm. It wasn’t a normal bushfire. This art of devastation and destruction is not normal.”

Several residents made reference to there being a distinction between different types of fires, for example:

“...we just thought it was going to be a bushfire and I tend to sort of think in three categories, bushfire, wildfire and fire storm and nobody had a clue that it was actually a fire storm until really fifteen minutes before the fire actually hit town.”

It appears that it is this distinction that this fire was much bigger than people expected, which resulted in many of the interviewees abandoning their plans to stay and defend and leaving, either seeking shelter at Gallipoli Oval or leaving Marysville for Alexandra.

Description of heat as the fire front hit Marysville

“so the heat would just cook you really from 80 metres you would be just cooked”

Couple who tried to stay and defend

“...the fire was coming a great deal close and we could hear the roar. It seemed to come very quickly at the last minute... We had a horizontal hailstorm of burning embers, some the size of golf balls, accompanied by a thick smoke cloud and gigantic flames leaping over the back fence towards our house.”

The fire was much faster than expected. This resident planned to switch on a fire pump connected to sprinklers on the house when embers started and then evacuate with her two children to the oval. She believed embers would start well before the fire arrived, giving her time to safely evacuate, but...

“So like when I first saw the embers, that was it – I went out and switched the pump on and it must have been like, would have been no more than a minute by the time – so it’s right at the back door...”

Went out, switched it on, walked back inside, grabbed these two, walked out to the car as the other door of the house, it was scary scary, like big chunky stuff flying through the air and there was very big flames like right at the back of the house. So it was just so incredibly quick.”

Observations from Gallipoli oval just before the convoy to Alexandra

“Houses were just exploding and the fire wasn’t even near them, you know, like I was watching the back houses up here when they went, and those houses, they weren’t even on fire. Just boom, boom, gone, like within – I dunno, I was probably watching for a minute and I saw four or five houses up there were already gone...”

Community Refuge/ Shelter

Three locations were identified by interviewees as places they believed were community refuge points (Figure 17):

- The Cumberland Hotel – a large brick building located on the main street in Marysville;
- Gallipoli Park – a sports oval close to the centre of town; and
- The clubhouse at the Marysville District Golf and Bowls Club – located approximately 2.4km from the centre of Marysville on the Marysville-Buxton Rd.(Figure 18)

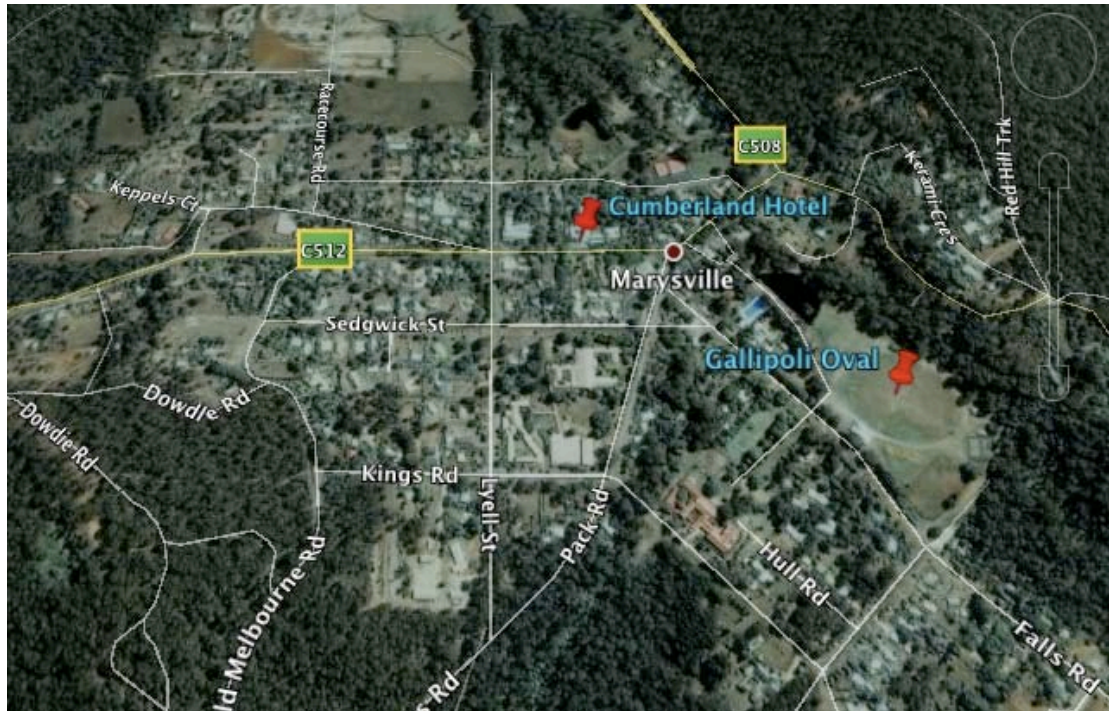


Figure 17 Location of Gallipoli Park and the Cumberland Hotel in Marysville (Google Earth, 2009)



Figure 18 Location of Marysville District Golf and Bowl Club, 2.4k, from Marysville town centre (Google Earth, 2009)

None of these locations were endorsed or maintained as official refuges, either by the CFA or the local council. Although not officially recognised, one interviewee recalled a discussion of refuges at a CFA community meeting, where it was suggested by the CFA that the oval might be a safe option, but the CFA were not able to officially recommend it. Another interviewee said the oval had, at one stage, been a designated refuge, as had the golf club and that although these places were no longer officially designated, residents remembered they once were.

“...in the CFA planning and going to the community meetings in the year, we had been to a number of these community meetings, the CFA had always made it very clear to us that there was no spot they would recommend because they weren’t going to take any responsibility. They did say Gallipoli Park would be a good spot, but the problem with that is there’s no toilets, no water, and no shade. So there’s the business if you’re going to end up being caught. They said places like the hotel or the Cumberland would be good because you could get food and water, if you had to stay for any particular time. But they weren’t making any recommendations.”

Despite there being no locations officially designated as refuge points, it appears individuals had designated these locations as safe areas. Some recalled that these locations were official refuge locations in the past, others just recognised them as a safe place to be during a bushfire. This interviewee is giving an opinion of why people would choose Gallipoli Park as a safe place.

“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.”

Gallipoli Park

Many interviewees went to Gallipoli on the advice of others (neighbours or friends). Many were intending to stay and defend, but on advice to leave for the oval, did so immediately.

A large number of people congregated at the oval in cars. On the advice of the SES, police officers organised and escorted an evacuation of the people out of Marysville at approximately 18.45 (Four Corners, 2009). From interviewee descriptions this occurred just as the fire was beginning to impact the town.

Although the roads were clear of trees, interviewees described the journey towards Alexandra as terrifying due to the strong winds, quantity of debris being blown around and the low visibility due to smoke.

“The sky was black and the car was hot from the black range – the heat radiation across the Maroondah Highway – the car was hot. Some cars ended up with blistered paint.”

“I would’ve hated to have been the last guy. He had all his tail lights melted on his car when he was driving out. That’s how close they were – the fire was following them out of town. It was like there, along the oval ... - we’re in our car – cops say go, we’re all going out that way. By the time we got out of there all this fire was down in there – in there and then the Mercedes Benz, his tail lights have melted that much that it’s dripped over the bumper down

the ... down the back of the thing before the lights and over the bumper. And there's even bits dripping down off the edge of the bumper."

Conditions in Marysville continued to deteriorate as the fire began to impact the town, more residents headed to Gallipoli Park to shelter. Several interviewees described the difficulty of finding the oval, despite knowing the town roads very well.

"I said, well I've done all I can. Get to the oval. I thought where's the oval? You couldn't see a bloody thing. So I saw a fire fighter come out and followed him, hopefully he was going to the oval. Lucky he was... They turned left so I left and they were going down towards the oval. We stopped there so we couldn't tell where we were. We thought we were on the oval, but we weren't though, we were about bloody 70 feet short of it."

After the first convoy, it became impossible for people to leave Marysville as trees had come down on the road and there was significant smoke and fire in the area. People arrived at the oval at this point, including a number of CFA and DSE personnel. These people stayed at the oval until the following morning, when a second convoy was escorted to Alexandra. On the oval, interviewees described it as frightening, but they felt safe. One interviewee described that DSE and the single police officer remaining in town, were in control of the situation, continually checking people were safe and coping.

"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."

The Cumberland Hotel

Three interviewees stated a DSE employee advised them to go to the Cumberland Hotel. On arriving there, they found it unoccupied.

"So we drove down to the Cumberland, probably about ten to six and nobody was there. It was completely empty and there were buckets of water around in the lobby and there were candles lit because the power was out but there was nobody to be seen."

Another interviewee said she had heard (not specified by whom) that elderly people were being taken to the Cumberland. She proceeded to take her mother there (she, her husband and children were intending to stay and defend) but on arrival met the proprietor:

"So I went down to the Cumberland. I drove down and ____ pulled up behind me. He said that we should just get out; he didn't want anybody in the Cumberland. Everybody that was there, they'd gotten out, they thought that we should just get out of town."

Although no interviewees sheltered in the Cumberland Hotel, there were residents who did. The following is an extract from a letter sent to the media by one resident who sheltered in the Cumberland during the passage of the fire (Walsh, 2009).

"I sheltered from the initial bushfire behind the rear glass doors of the Cumberland, on the lower level (which is below ground level). And hence the area was relatively cool; no smoke; only severe noise from the wind."

The Cumberland Hotel was one of the buildings destroyed by the fire, and from Mr Walsh's account, this fire could have been put out and the subsequent tragic loss of lives, prevented.

"When I left, the sprinklers were still running outside the lower level. The building eventually burned down, an hour or more after I left, due to a fire which spread from the pittosporum hedge near the kitchen- a fire which could have been extinguished initially with a garden hose."

Despite sheltering on the lower level whilst the fire passed, Mr Walsh believes the people sheltering at the Cumberland Hotel moved to the upper level and remained there once the building had caught alight.

"The victims inexplicably moved into the building, from the rear door to the upper level of the building-perhaps to sit in the lounge, because the bushfire had passed. This was a possibility I did not foresee, because it defied logic. When fire broke out, they stayed inside instead of escaping; or at least returning to the lower level again (the bedrooms below, near the staircase, were virtually untouched.) The basic lower structure of the Cumberland remained unchanged- although eventually damaged from the fire on the floor above; but not by the bushfire."

Marysville District Golf and Bowls Club

The third location residents went to seek refuge was the clubhouse at the Marysville District Golf and Bowls Club, located approximately 4 kilometres from Marysville on the Marysville-Buxton Rd. A number of interviewees went there once they realised Marysville was going to be impacted. One interviewee, who was amongst the first to arrive at the clubhouse at approximately 18:00, estimated between 100-150 people were there when the SES arrived and evacuated them. This is her description of the conditions just prior to evacuating:

"...on the sort of south west side or the south side of the clubhouse is where ___ and ___ were hosing and he could feel the radiant heat. You could look over there and you could see the wall of flames coming and you could hear it. You could hear the roar and it sounded like a jet engine. It was hot."

The evacuation of the clubhouse occurred concurrently with the evacuation of Gallipoli Park, thus cars leaving the clubhouse joined the convoy of cars coming from Marysville.

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