

4.0 Weather conditions and wildfires ignited on 7 February 2009

4.1 Temperature

To begin with, Karoly (2009) provides an overview of the temperatures on the day. He states that Melbourne and much of Victoria had record high maximum temperatures on 7 February. Melbourne had a new record maximum of 46.4°C, 0.8°C hotter than the previous all-time record set on Black Friday 1939 and 3°C higher than the previous February record set on 8 February 1983. Tolhurst (2009) explains that these high temperatures lead to rapid and extreme fuel drying, bringing these fuels closer to the kindling temperature and aiding ignition.

4.2 Relative humidity and fuel moisture content

Karoly (2009) notes that new record low values of relative humidity were set on 7 February in Melbourne and other sites in Victoria, with values as low as 5 per cent in the late afternoon. He states that the very low humidity was likely to have been associated with the unprecedented low rainfall in Melbourne since the start of the year and the protracted heatwave. Tolhurst (2009) explains that this dries out dead fuel and stresses live fuel, decreasing their moisture content.

Sullivan and McCaw (2009) show that on 6 February at Kilmore Gap the minimum surface moisture content (SMC) reached about 6.2 per cent at 3pm. In the evening this increased to a maximum of just 13.2 per cent at 9pm. From then until 5am on 7 February the SMC dropped slightly to about 11.9 per cent. Following sunrise, the SMC decreased rapidly during the morning until it reached 4.6 per cent at midday. Over the next four hours, the SMC decreased to around 4 per cent before increasing rapidly with the arrival of the wind change at 5pm. Sullivan and McCaw's simulation suggests that the moisture content of the fine fuels was extremely low due to the very hot and dry conditions, resulting in high combustibility and increased availability of fuel.

4.3 Wind speed

Karoly (2009) notes that the weather pattern and northerly winds on 7 February were similar to those on Ash Wednesday 1983 and Black Friday 1939. Sullivan and McCaw (2009) note wind speeds exceeding 70km/h and gusts exceeding 90km/h at Kilmore Gap.

4.4 Fires on 7 February 2009

Early in the morning of 7 February fires were reported east of Melbourne around the Bunyip State Park (ABCd 2009). These were believed to be ignited by lightning, but other fires in this region were deliberately lit in the days before 7 February and these fires continued to burn into the catastrophic conditions of 7 February (Miller 2009). According to reporting on the ABC's Four Corners of 16 February 2009 (ABCd 2009), the Emergency Response Centre was focusing its initial attention on the Bunyip fire.

At 11:49am a fire started on farmland in the Kilmore East region was later found to have resulted from a fallen single wire earth return (SWER) power line (Clancy 2009, Royal

Commission 2009). This fire was to eventually burn through Kinglake and Chum Creek. Further fires were ignited around the state by failing power infrastructure between 12:26pm and 1:17 pm (Thom 2009, Tobin 2009).

At 1:33pm a fire, which was later found to have been deliberately lit ignited in a hardwood plantation south of Churchill in South Gippsland. This fire was to eventually burn through a number of small communities in the Strzelecki Ranges (Cooke and Silvester 2009).

Just before 3pm, another fire was deliberately lit on cleared farmland near the old Murrindindi Sawmill. This fire was to burn through to Narbethong and Marysville (Four Corners-b 2009, Royal Commission 2009, AAP 2009).

At 3:11pm, a fire broke out on farmland at Redesdale. West of this fire, another was ignited on a paddock near Bendigo (ABCd 2009). Lightning is thought to have started the fires near Dargo and Erica (Waller 2009). At 6:09pm, a fire in the Beechworth area was reported to DSE (Waller 2009). This is believed to have started by tree branches falling on power lines (Weekly Times 2009).

Lightning is thought to have ignited the fire at Mount Riddell, east of Healesville, later in the day of 7 February. The large pyro-cumulus cloud rising above the Kilmore East fire is thought to have generated the lightning strike (Royal Commission 2009, Blair pers comm Rees pers comm). A summary of the fires is provided in Table 4.1 below:

Fires ignited on 7 Feb 2009	Reporting of fire	Reported ignition source	Land tenure at ignition	Total area affected (ha)
Bunyip	04.02.09	Arson	State Park	26,200
Kilmore East	11:50am	Power line	Private property	127,676*
Horsham	12:26pm	Power line	Private property	2,200
Coleraine	12:36pm	Power line	Private property	775
Weerite	1:17pm	Power line	Private property	1,300
Churchill	1:33pm	Arson	Pine plantation	24,500
Murrindindi	2:57pm	Arson	Private property	131,712*
Redesdale	3:11pm	Unconfirmed	Private property	9,500
Bendigo	4:34pm	Arson	Private property	330
Erica	6:00pm	Lightning	State forest	1,778
Beechworth	6:09pm	Powerline	State forest / private property	31,000
Dargo	N/A	Lightning	State forest	13,640
Mt Riddell	N/A	Lightning	National Park	Part of Kilmore East
Total	-	-	-	370,611

Table 4.1 List of fires burning on 7 February 2009 by start time, ignition source and land tenure and subsequent area affected by the fire.

Source: *Summary of Incidents of Public Land* by DSE and joint *State Fire Situation Reports* by DSE and CFA, 20 February 2009. (* These figures are estimates by the author based on measuring DSE maps showing extent of fires, not DSE figures for the Murrindindi north and south divisions. These figures vary from DSE figures because the administrative boundaries

between the Kilmore East and Murrindindi fires do not reflect the actual area burnt by each fire.)

According to the data in Table 4.1, failing power infrastructure was the single largest ignition source of the fires across the state, comprising 38 per cent of the total. Arson was responsible for 31 per cent, followed by lightning at 23 per cent. Unconfirmed sources comprise the remainder. These percentages are detailed in Figure 4.1.

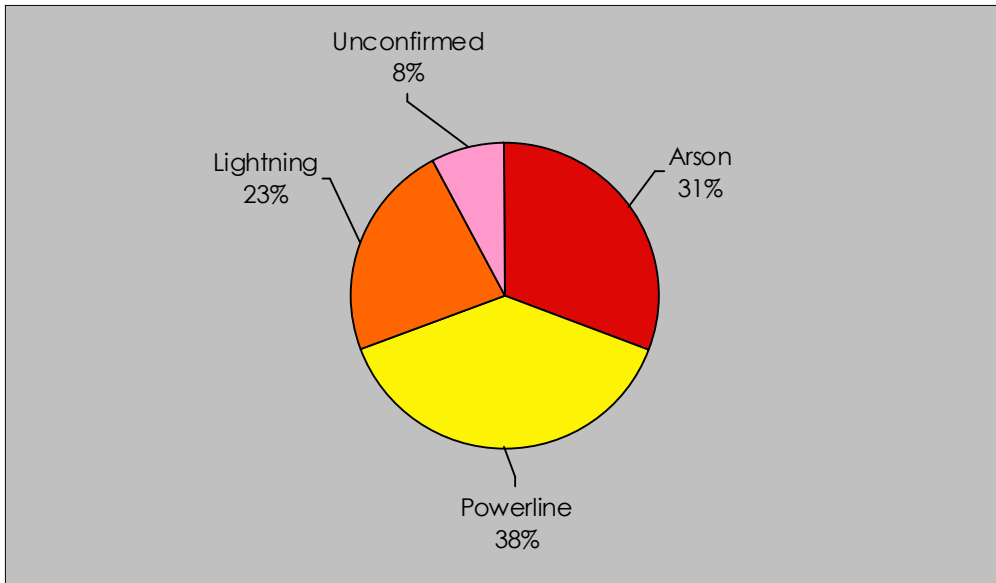


Figure 4.1 Proportions of fire ignition sources

Half of the total area burnt was from fires started by acts of arson. Failed power line infrastructure accounted for fires affecting 40 per cent of the burnt area. Lightning started fires that burnt 7 per cent of the total area burnt, while in 3 per cent remains unconfirmed. These percentages are expressed in a graph in Figure 4.2.

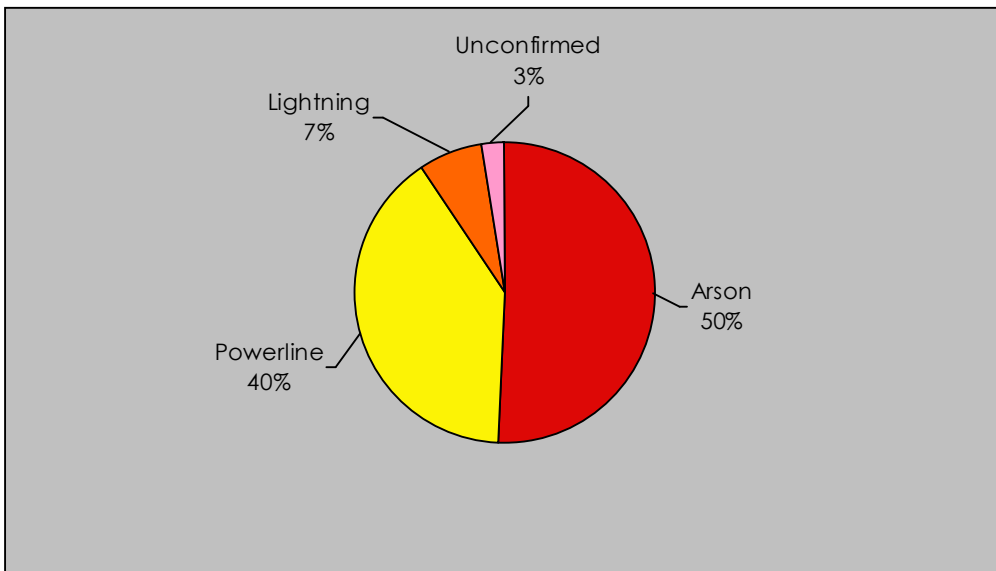


Figure 4.2 Proportion of Area Burnt by Ignition Source