

Fire Management Branch
Department of Conservation & Environment

HEATHCOTE FIRE
BENDIGO FIRE NO. 38-
1986-87

RESEARCH REPORT NO. 27
P BILLING
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INTRODUCTION

Two fires were already burning near Costerfield and north of Redcastle when a fire started at 1510 hours on 16 January 1987 in grassland 2 km west of Derrinal (Figure 1), probably from a faulty trail bike exhaust.

Fire danger was extreme at the time, with the F.D.I. close to 100 (Figure 2), so the fire developed very quickly fanned by a 50 to 60 km/hr west to north-west wind.

The fire crossed the McIvor Highway just south of Derrinal at 1520 hours, but a wind change to the north-west spread the fire along the highway towards Heathcote. At 1545 hours the head of this narrow fire was only 2 km from Heathcote but a wind change to the west eased the threat to the town, but caused the north-eastern edge of the fire to spread more rapidly.

Much of the grass along Mt Ida Creek and McIvor Creek was not fully cured. These areas together with large lucerne paddocks resulted in the fire fragmenting into several narrow tongues. Two of these fire fronts crossed the Northern highway between Mt Ida and Heathcote. At 1600 hours these narrow tongues were burning parallel, about 1 km apart.

The tongue immediately south of Mt Ida developed a wider front than the tongue closest to Heathcote which had burnt between lucerne paddocks.

This 'twinning' behaviour, known to be extremely dangerous, was reinforced by the wind which remained in the west until after 2000 hours, although it was slowly easing in strength. By 1745 hours the northern head had reached Pavey Road and spread up the southern slope of Mt Ida to the tower and along Mt Ida Creek.

The southern head had burnt over the range just north of Heathcote and was entering grassland, but its southern flank was prevented from spreading into the town by green grass at the Golf Course and by lucerne paddocks along McIvor Creek.

By 1915 hours both fire tongues had burnt together up to Pavey Road (Figure 1) while the head of the southern tongue had spread rapidly through grassland towards the Heathcote - Nagambie Road south of Costerfield. The northern tongue spread much slower during this period, mainly due to shelter from wind and less abundant fuel.

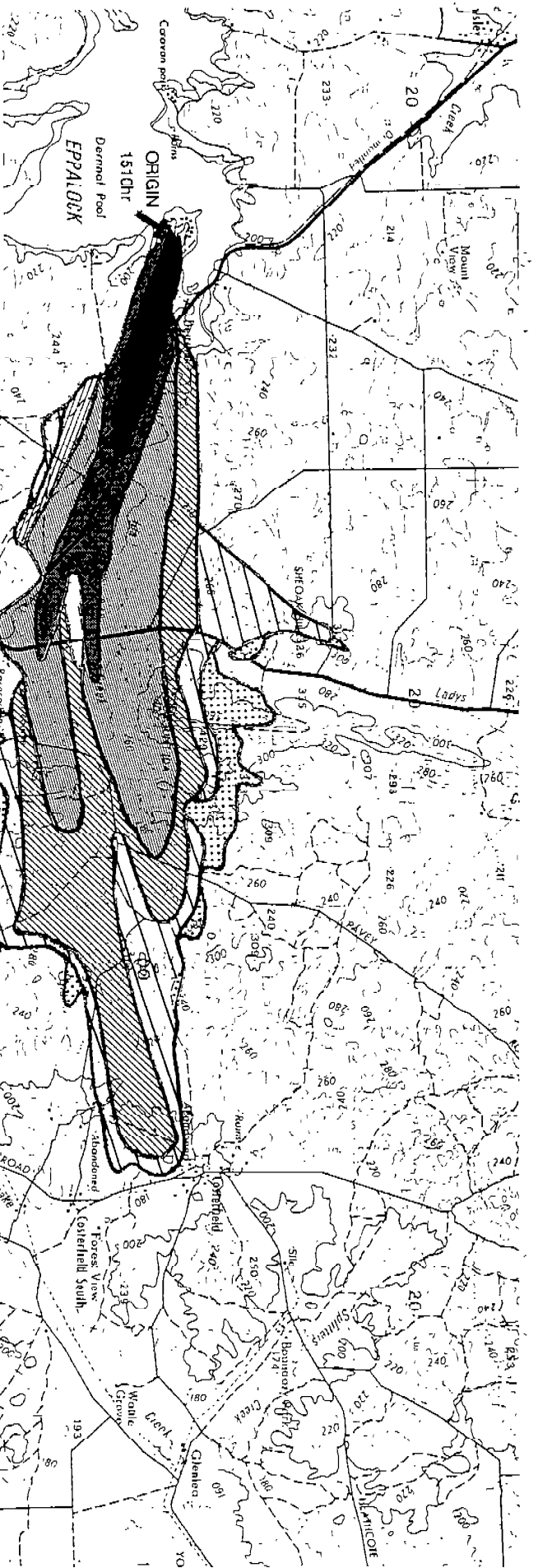


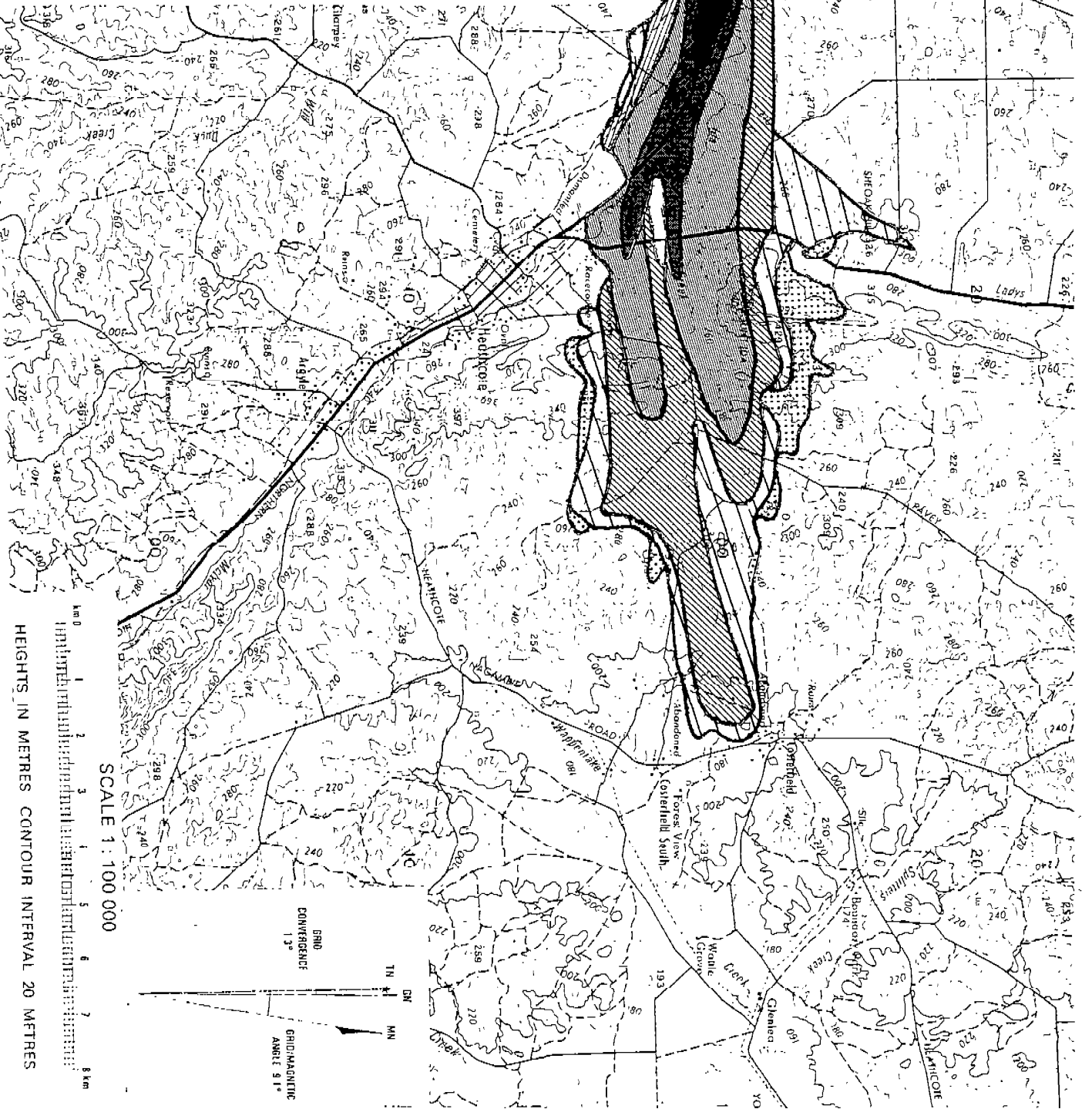
FIGURE 1

FIRE SPREAD MAP

BENDIGO FIRE 38

1986/87

Origin	1510hrs	1530hrs	1600hrs	1745hrs	1915hrs	2045hrs	2400hrs



SCALE 1:100 000

HEIGHTS IN METRES CONTOUR INTERVAL 20 METRES

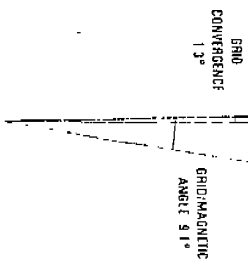
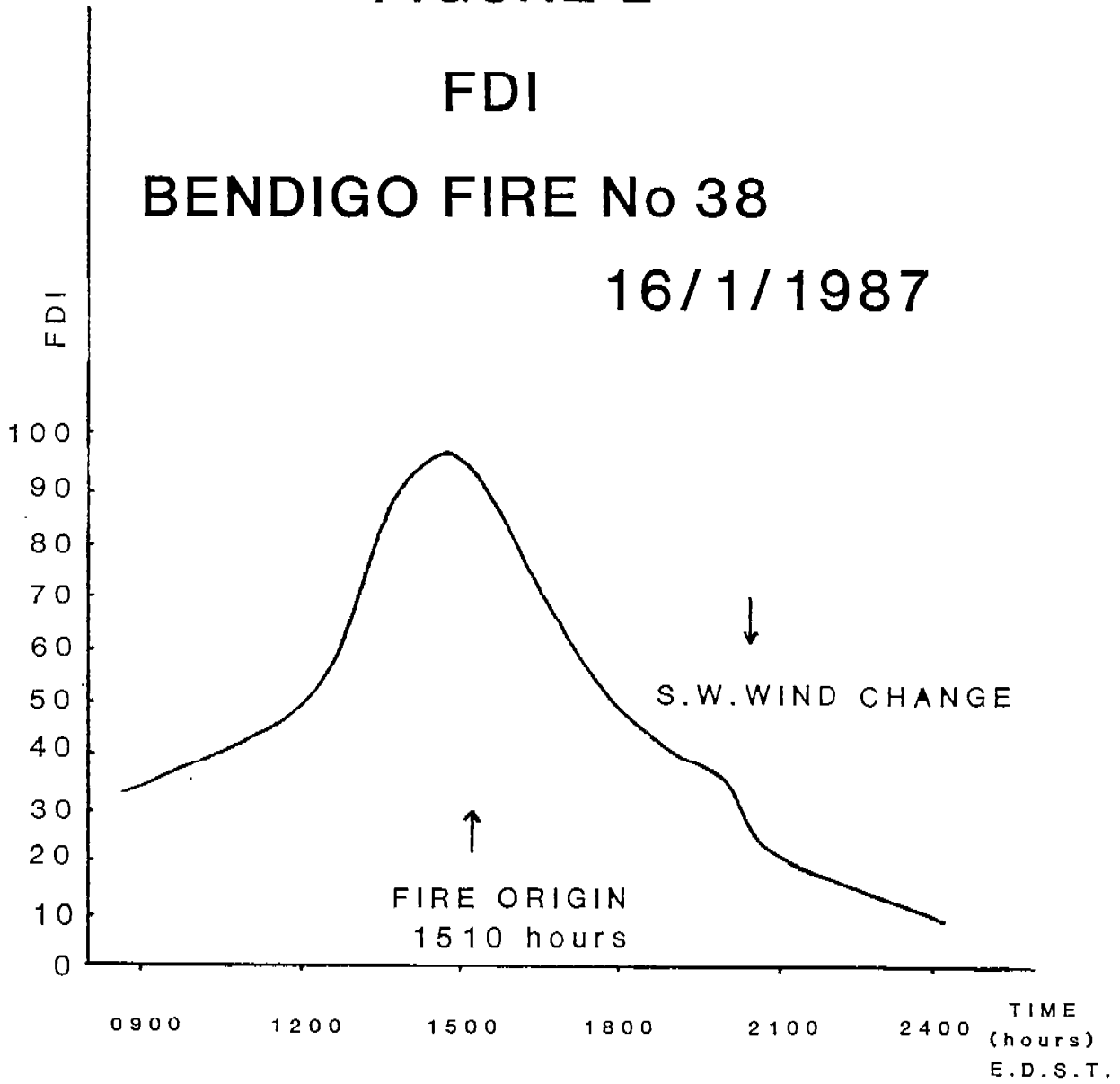


FIGURE 2

FDI

BENDIGO FIRE No 38

16/1/1987



The south westerly wind change occurred at 2010 hours, with the wind speed easing from around 50 km/hr to around 25 km/hr within 30 minutes. Immediately the northern flank of the fire became more active, with a significant breakaway burning to Sheoak Hill, while in the box-ironbark forest between Mt Ida and Pavey Road the fire was still quite active.

By 2100 hours most of the fire edges in grassland were either controlled or had abated due to the rapidly moderating conditions and a drop in wind speed to 10 to 15 km/hr.

Fire activity was confined to box-ironbark forest by 2400 hours.

The total area burnt was 4140 hectares.

WEATHER

Figure 3 shows the synoptic situation at noon 16.1.87. The main features are a high pressure cell over the Tasman sea with a low pressure system to the south of Tasmania associated with a cold front extending through Western Victoria. A low pressure trough ahead of the cold front was directing a very strong to gale force north to north west wind across central and western districts with temperatures in the high 30's and relative humidity below 20%.

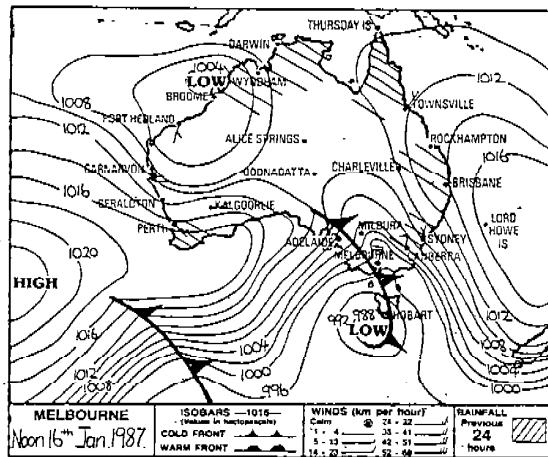


Figure 3.

Synoptic Chart. Noon 16/1/87

Wind speed in the fire area at 1500 hours was 50 to 60 km/hr with gusts of over 70 km/hr, but with the approach of the weakening cold front the wind speed eased to around 40 km/hr from the west by 1600 hours.

Although not an indicator of wind at Heathcote, the Dines anemograph recorded at Melbourne Airport, 90 km to the south west, shows the wind gradually eased from about 1500 hours, with the wind changing to the south west at around 1540 hours (Figure 4). This wind change did not reach the fire area until after 2000 hours.

FIRE BEHAVIOUR

The initial spread in grassland was around 11 km/hr, mainly due to the abundance of dry grass and wind speed of around 60 km/hr. As the fire burnt into box-ironbark forest spread rates eased partly due to the lower fuel quantities and shelter from the wind.

The disruptive effects of lucerne paddocks and green grass along McIvor Creek caused the fire to fragment, reducing spread rates to around 7 km/hr. As the wind moderated, spread rates eased further, partly due to the fire fragmenting, but also due to quite low fuel quantities in iron-bark forest along the range north of Heathcote and in grassland which was not fully cured. Increases in spread rates to 3 to 4 km/hr between 1745 hours and 1915 hours were due to higher fuel quantities in well cured grassland.

As the wind changed to the south-west fire activity along the northern edge of the fire increased. A significant 'breakaway' in grassland burnt along a ridge to Sheoak Hill but elsewhere in grassland the fire edge and spot fires were held. Due to difficult access for fire crews the fire continued to spread in the iron-bark forest north of Mt Ida, although spread rates were less than 0.4 km/hr. Roughly 3000 ha were burnt before the south west wind change and about 1100 ha. following the wind change.

Obviously fuel quantities and moisture content had a large bearing on the fire spread pattern. Where grass fuels were fully cured forward spread rates were as expected under the prevailing extreme conditions (McArthur 1977). However, the significant areas of lucerne, and green to semi-cured grassland particularly along McIvor Creek reduced spread rates and broke the fire into two main tongues.

Fully cured fuels throughout this area under these conditions would have contributed to a much more rapid fire development, burning over a much larger area.

Reference: McArthur 1977. Grassland Fire Danger Meter. MK5.

TABLE 1

BENDIGO FIRE NO. 38

FIRE BEHAVIOUR

PERIOD Hours	TIME Mins.	SPREAD DISTANCE KM	MAX. F.R.O.S. KM/HR	MEAN F.D.I.*	FUEL TYPES
1510	20	3.7	11.1	90	Fully cured grass- land 3-5 t/ha.
1530	30	3.9	7.8	85	Mix box-ironbark and grassland.
1600	105	3.1	1.8	60	Semi cured grass- land box-ironbark forest.
1745	90	5.6	3.7	45	Fully cured grassland and box- ironbark forest.
1915	90	2.7	1.8	30	Fully cured grassland and box- ironbark forest.
2045	195	1.2	0.4	15	Box-ironbark forest. 5-10 t/ha.
2400					

* McArthur 1973, Forest Fire Danger Meter. MK 5.

FIGURE 4 WIND DATA

WIND DIRECTION - DEGREES
FROM TRUE NORTH

WIND SPEED km/h

