
Fire Management Branch

THE BRIGHT PLANTATION
FIRE
NOVEMBER, 1982

RESEARCH REPORT NO. 19
N WATSON, G MORGAN,
D ROLLAND
APRIL 1983



Department of Conservation & Environment

Fire Management Branch
Department of Conservation & Environment

THE BRIGHT PLANTATION
FIRE
NOVEMBER, 1982

RESEARCH REPORT NO. 19
N WATSON, G MORGAN,
D ROLLAND
APRIL 1983

INTRODUCTION

The fire started within the Two Mile Creek Plantation of Bright Forest District at 1400 hours on 24 November 1982. It originated in slash from clear felling operations in a stand of radiata pine (*Pinus radiata*) planted in 1931, and is thought to have been caused by a spark from a chainsaw.

During the first two hours the fire was confined to the logging slash and four spotfires which had started in a recently planted area south of the fire origin. These separate fires were being satisfactorily handled by suppression forces until a dramatic increase in wind speed at approximately 1600 hours caused significant spotting from the slash area and vastly increased rates of spread. The fire spotted into, and burnt rapidly through, plantation areas (mostly radiata pine) on both sides of the Ovens Valley Highway. The major run of the fire lasted until 1800 hours and by the time control was achieved at 1700 hours on the second day 332 hectares of plantation had been burnt together with adjacent private property and eucalypt forest.

This report describes the progress of the fire and compares its behaviour with the behaviour of other plantation fires.

FIRE DESCRIPTION

1400-1600 hours - Day 1

The fire started in logging slash, resulting from clear felling operations in a stand of radiata pine planted in 1931, at approximately 1400 hours. The FDI⁽¹⁾ was 32 ($T = 38^{\circ}\text{C}$, $\text{RH} = 15\%$, wind NW 10 km/hr).

Until 1600 hours the main fire was confined to the logging slash north of the firebreak leading down a spur to Mill Bend on the Ovens Highway (Fig. 1). Four spotfires had started in the 1982 planting area to the south and south-east, but because there was little fuel hand crews were well advanced in establishing control lines.

1 *The Forest Fire Danger Index described by McArthur (1967)*

1600-1700 hours - Day 1

At 1600 hours the wind speed increased to an estimated 40 km/hr, with gusts to 60 km/hr, from the north. The FDI was now 64 and major spotting began to occur. Around 1615 hours spotting from the slash area carried the fire over the Ovens Highway south of Mill Bend (Pt A, Fig. 1) and into a 1931 planting of ponderosa pine (*P. ponderosa*) (Pt B, Fig. 1), a distance of 600 m. This spotting eventually caused the development of two separate fire fronts.

These major spotfires spread quickly. North of the Highway the fire burnt through 17-20 year old radiata pine with an average spread rate of 1.1 km/hr. By 1700 hours it had reached 5 year old plantation and the short distance spotting process remained well developed. On the south side of the Highway the spotfire in the ponderosa pine was particularly intense, and it moved swiftly into the adjacent 43 year old radiata pine. Photographs of this time show flame heights reaching 4 times tree height (≈ 160 m) in the radiata pine. Further spotfires were started 800 m away near Tower Hill (Pt C, Fig. 1) and 1600 m away near Stackey Gully (Pt D, Fig. 1).

The spotfire near Tower Hill was burning in 43 year old radiata pine. As happened earlier in the ponderosa pine a full crown fire developed as the fire burnt uphill, and the increased intensity was probably responsible for another major spotfire some 1.8 km distant (Pt E, Fig. 1) which was discovered after 1800 hours. This new spotfire spread through both plantation and eucalypt forest and formed the Water Reserve Sector.

1700-1800 hours - Day 1

The FDI remained extreme as the strong northerly wind was maintained over the fire area. Houses and private property on both sides of the Highway were seriously threatened but effective work by suppression crews protected most private assets.

Most of the plantation north of the river had been burnt out by 1800 hours with the fire being held south of the railway line. A new spotfire originated 1 km from this fire front (Pt F, Fig. 1) just north of Bright township. This was to form the Golf Course Sector, but immediate suppression work could not be undertaken because of a lack of manpower.

The two fronts created by the early spotting joined near the intersection of Tower Hill Road and the Highway and by 1800 hours the main front was burning in Stackey Gully, approximately 3 km from the origin.

1800-2200 hours - Day 1

Sometime after 1800 hours the wind eased and the FDI decreased to 33-37 ($T = 35^{\circ}\text{C}$, $\text{RH} = 15\%$, wind 15-20 km/hr from the north/north-west). The incidence of spotting also decreased and no further spotting, over the distances described earlier, eventuated.

The main fire front was now moving to the south/south-west, with the eastern flank just over Stackey Gully. Most of this front was burning in 7 and 9 year old radiata pine and spreading at 150 m/hr. Although the fire spread had slowed dramatically intermittent crown fire was still occurring because of the nearly continuous vertical distribution of fuel in these young stands.

The spotfire which formed the Golf Course Sector had originated in 4 year old radiata pine. It then burnt through an area of 54 year old radiata pine and some logging slash before being controlled by 2130 hours.

In the Water Reserve Sector the spotfire which had started in eucalypt forest was now spreading into plantation, mostly 10 year old Douglas fir (*Pseudotsuga menziesii*), on the southern side of the spur.

2200-0800 hours - Days 1 and 2

By 2200 hours the FDI was 15 ($T = 29^{\circ}\text{C}$, $\text{RH} = 32\%$, wind 15-20 km/hr) and the overnight minimum temperature was 17°C . The fire continued to spread slowly (mean rate of spread = 130 m/hr) but steadily throughout this period in the 1972 radiata pine east of Snake Ridge and south of Wallaby Hill. The fire also crossed Ritchie Road near Deep Creek but was held by newly dozed control lines.

Backburning north-east from Wallaby Hill and down the road to Tower Hill commenced at 2200 hours. A breakaway at 0515 hours near Wallaby Hill was controlled while still small. Backburning in the eucalypt forest of the Water Reserve Sector commenced at 0515 hours and continued throughout the day.

0800-1700 hours - Day 2

At 1100 hours the FDI was 18-24 ($T = 26^{\circ}\text{C}$, $\text{RH} = 30\%$, wind 25-35 km/hr) and it became difficult to hold the newly established control line near Ritchie Road. At 1545 hours, when the FDI was 15 ($T = 23^{\circ}\text{C}$, $\text{RH} = 40\%$, wind 35 km/hr) this line was lost and further backburning which commenced at 1700 hours was required (Fig. 2).

No more significant areas were burnt after 1700 hours.

DISCUSSION

A summary of fire behaviour is provided in Table 1 and a species/age class map is shown in Figure 3.

TABLE 1: Fire Behaviour

Time	Temp (°C)	RH (%)	Wind (km/hr)	FDI	Stand Type	Rate of Spread (km/hr)	Spotting Distance (km)
1400-1600	38	15	10 NNW	32	Slash	0.2	0.3
1600-1700	37	15	40 NNW	64	1931 <i>P. ponderosa</i> , 1939 <i>P. radiata</i>)	1.1	1.6
					1962 <i>P. radiata</i>) 1965 <i>P. radiata</i>)	1.1	Unknown
1700-1800	36	15	40 NNW	62	1939 <i>P. radiata</i>	0.7	1.8
1800-2200	35	15	15-20 NNW	33-37	1973, 1975 <i>P. radiata</i>	0.15	0.2
2200-0700	17-29	60-32	15-20 NW	4-13	1972 <i>P. radiata</i>	0.13	-

The most significant feature of this fire was the relatively long distance spotting. Between 1600-1800 hours, when the FDI was extreme, spotting distances were up to 1.8 km. The longest distance spotting originated from the crown fires which occurred in 51 year old ponderosa pine, and then 43 year old radiata pine, as the fire spread up steep slopes. The longest spotting distance recorded from a plantation fire in Australia is 2 km. This was during the Wandilo fire of 1958 and following a period of intense fire activity caused by converging fire fronts.

The average spread rates of the flame front were low in comparison with those recorded for other plantation fires (Table 2) considering the FDI level was extreme. The relatively discontinuous fuel distribution present in the mature stands burnt in the early stages was probably the major reason for this; although the long distance spotting made the effective spread rate much higher.

TABLE 2: Comparisons of Fire Spread

Fire	Stand Type	Max. FDI	Rate of Spread (m/hr)
Caroline ¹	Mostly <i>P. radiata</i> and <i>P. pinaster</i> aged 9-18 years.	64	3000 - 5000
Wandilo	Mostly <i>P. radiata</i> and <i>P. pinaster</i> aged 23-24 years.	33	1200 - 1600
Longford ²	9-10 year old <i>P. radiata</i>	29	600 - 800
Bright	51 year old <i>P. ponderosa</i> and 43 year old <i>P. radiata</i>	62	1100

¹ Billing (1980)

² McArthur (1965)

REFERENCES

- Billing, P R (1980) Some aspects of the behaviour of the Caroline
fire of February 1979.

Fire Research Branch Report No 7. Unpublished.
- McArthur, A G (1965) Fire behaviour characteristics of the Longford
fire.
F & T B Leaflet No 91.
- McArthur, A G;
D R Douglas and
L R Mitchell (1968) The Wandilo fire, 5 April 1958.
F & T B Leaflet No 98.
- McArthur, A G (1967) Fire behaviour in eucalypt forests.
F & T B Leaflet No 107.

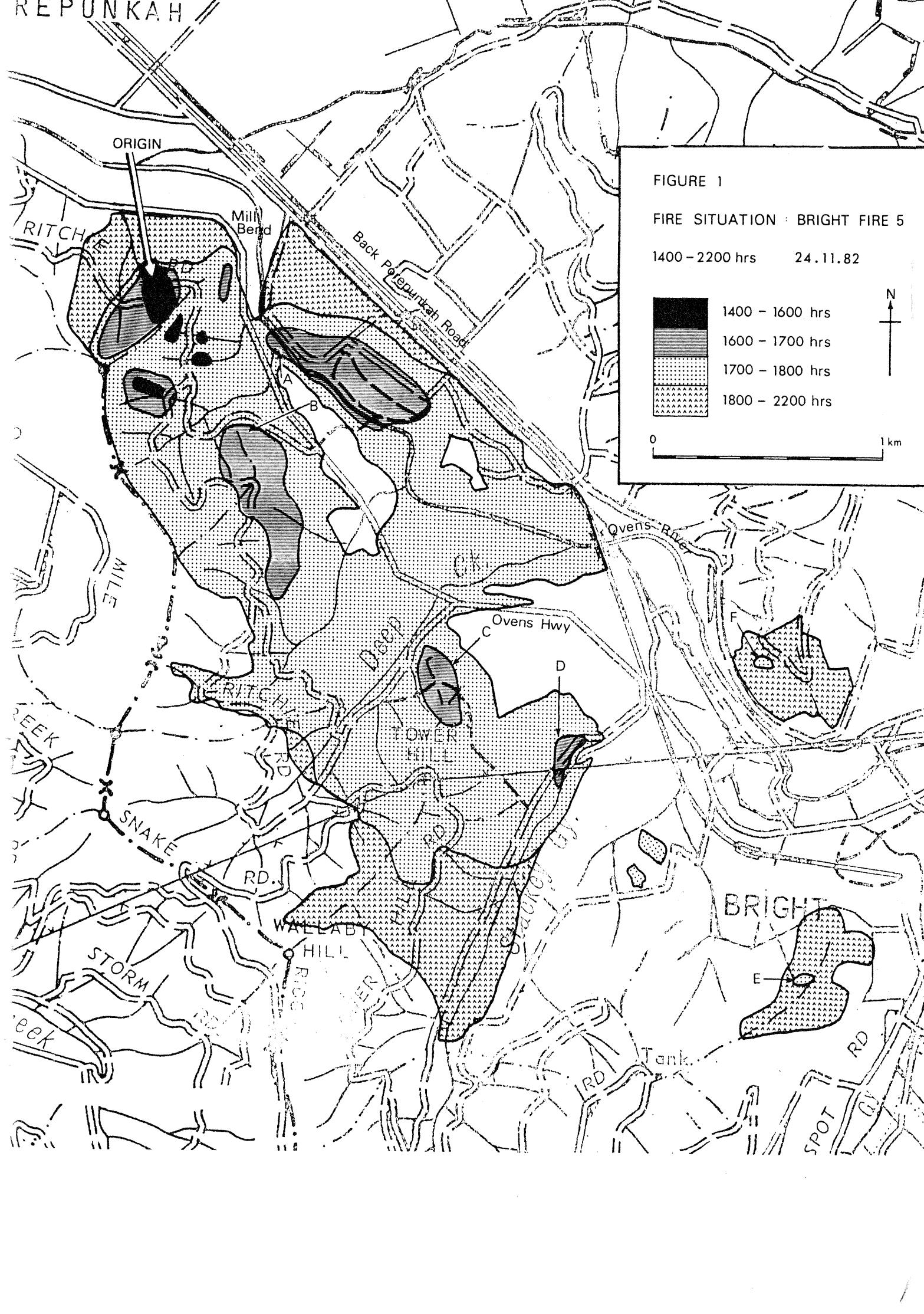
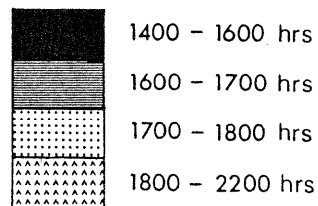


FIGURE 1

FIRE SITUATION : BRIGHT FIRE 5

1400 - 2200 hrs 24.11.82



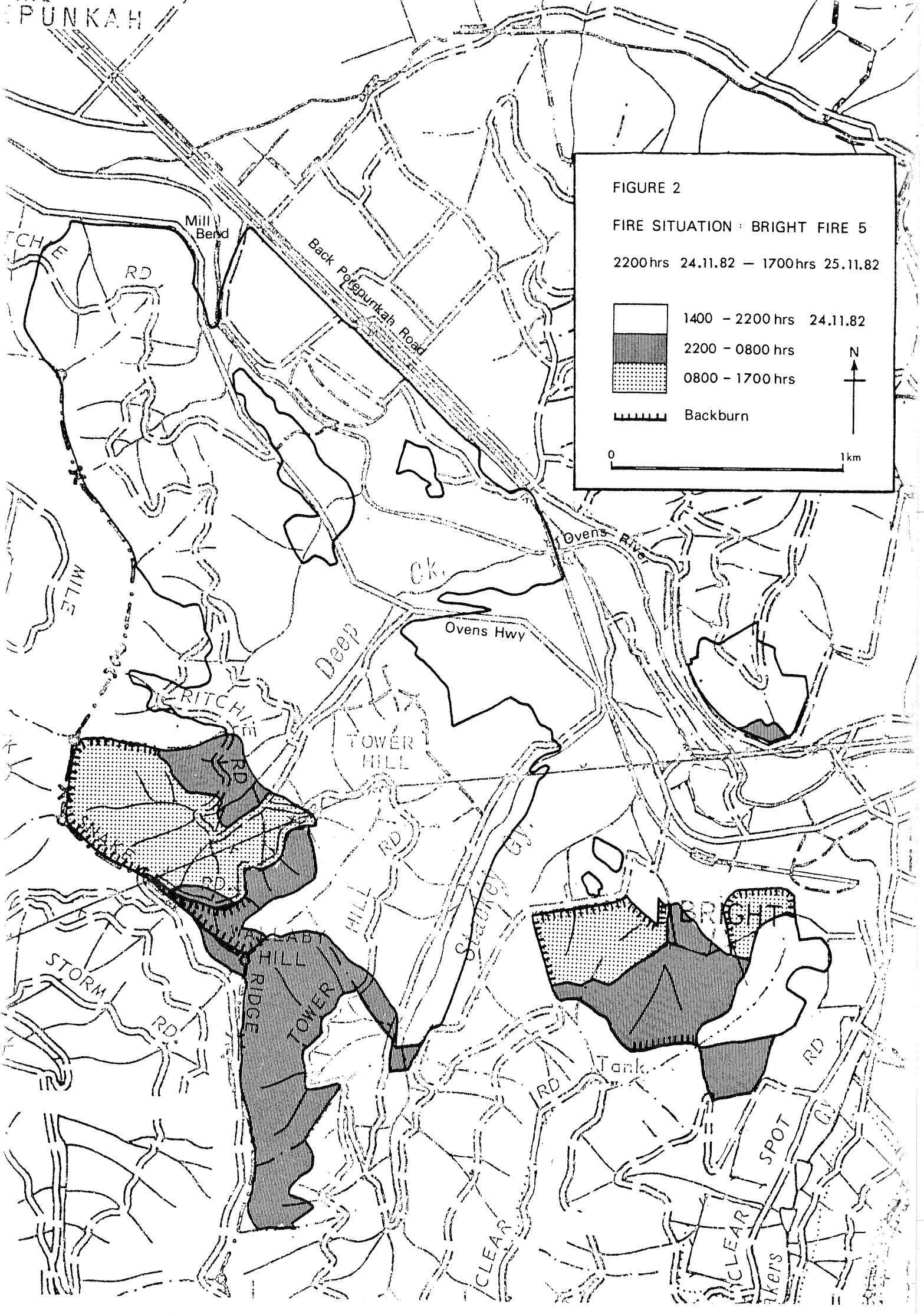
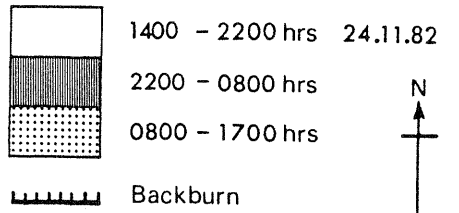


FIGURE 2

FIRE SITUATION : BRIGHT FIRE 5

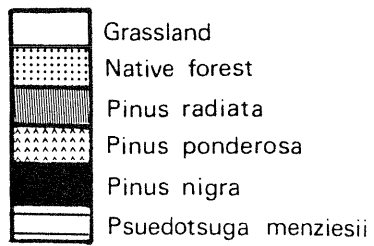
2200 hrs 24.11.82 - 1700 hrs 25.11.82



0 1km

FIGURE 3

BURNT AREA
VEGETATION MAP



1982 Planting year
 S Plantation slash

