

# FIRE NOTE

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## BILLO ROAD PLANTATION FIRE

### SUMMARY REPORT ON FIRE BEHAVIOUR AND SUPPRESSION ACTIVITIES

The Billo Road Fire provided a unique opportunity to study fire behaviour in pine plantations over a broad range of stand structures and fire environment conditions.

The report on this fire (online at [www.bushfirecrc.com](http://www.bushfirecrc.com)) focuses on the analysis of the weather, fuel and associated observed fire behaviour.

Particular attention was given to:

- (1) quantifying the effect of fuel complex structure on fire behaviour, and its relationship to fire propagation
- (2) understanding the effect of silvicultural operations on fire behaviour
- (3) evaluating the adequacy of fire behaviour models to predict fire spread and intensity in exotic pine plantations in Australia.

Between 10 and 14 December 2006 the Billo Road Plantation Fire burnt 10, 866 hectares (Figure 1) - including 9526 hectares of radiata pine (*Pinus radiata* D. Don) plantation in the Buccleuch State Forest, 20 km east of Tumut, in New South Wales.

The fire was started deliberately during the night, and burnt under mild conditions before being detected in the morning of 10 December. Within the first two days, three major fire runs characterised by a combination of crown fire propagation and surface fire with short distance spotting in recently logged or planted compartments burned 4700 hectares at an average rate of 320 ha/hour.

Rates of spread in sustained crown fire runs varied between 1.2 to 2.4 km/h. Fire spread in the logging slash varied between 0.6 to 2.4 km/h during the most severe burning conditions (Figure 2, over page).

Significant factors in the propagation of the fire included the extreme dryness of surface fuels in recently logged or planted compartments, which contributed to abundant spotting activity, and the flammability of unthinned immature (10–15 year old) radiata pine stands.

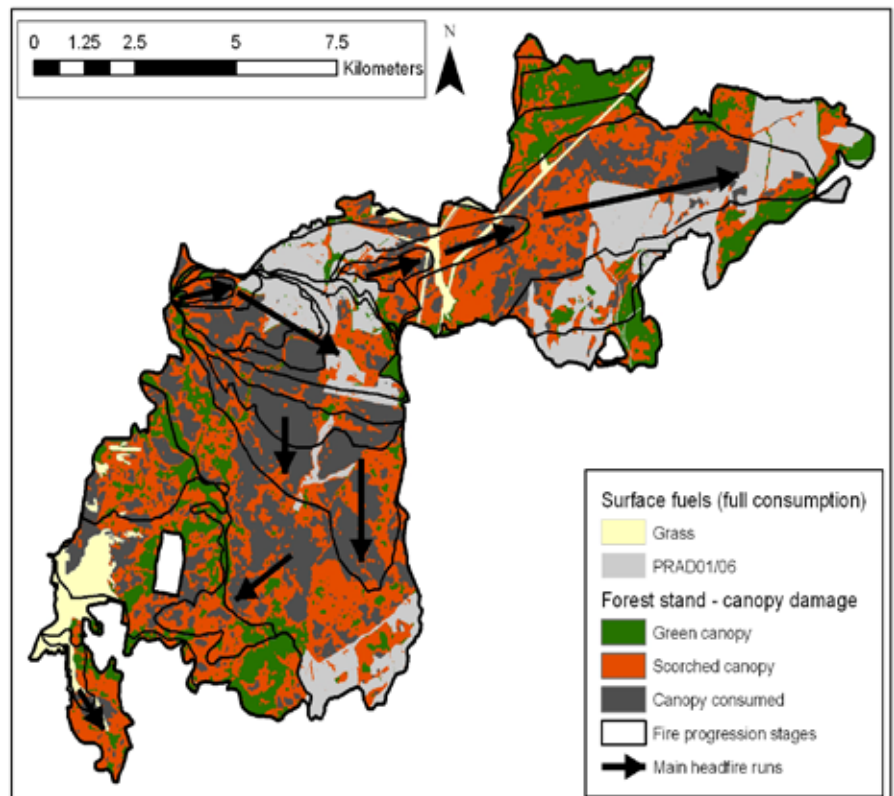


Figure 1. Progression of the Billo Road fire perimeter highlighting the level of surface versus crown fire activity. green canopy areas carried low intensity surface fire, scorched canopy sustained moderate to high intensity surface fire, and the canopy consumed category refers to crown fire spread.



Left: 10 December 2006, a crown fire run in a 15 year-old radiata plantation with an estimated fire intensity of 20,000kW/m.

Photo: Steve Cathcart.

The vertical continuity between fuel layers in the the immature stands allowed the development of crown fire activity in moderate burning conditions during a night run (Figure 2). The spatial distribution of these two fuel complexes in the Buccleuch State Forest allowed the fire to propagate with extreme fire behaviour even under moderate wind speeds (< 20 km/h).

Fire activity in the ensuing days (maximum Forest Fire Danger Index (FFDI) between 8 and 14) was moderate with occasional occurrence of short lived crown fire runs. The fire was finally contained to established fuelbreaks and burnout lines on 14 December.

## MORE INFORMATION

The full report is at: [www.bushfirecrc.com](http://www.bushfirecrc.com)

*Billo Road Fire: Report on fire behaviour phenomena and suppression activities.*

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Above right and below: The Billo Rd Fire of December 2006 burnt almost 10,000 hectares of pine plantation over four days. (Photo: Jason Vincent, above, Steve Cathcart, below.)

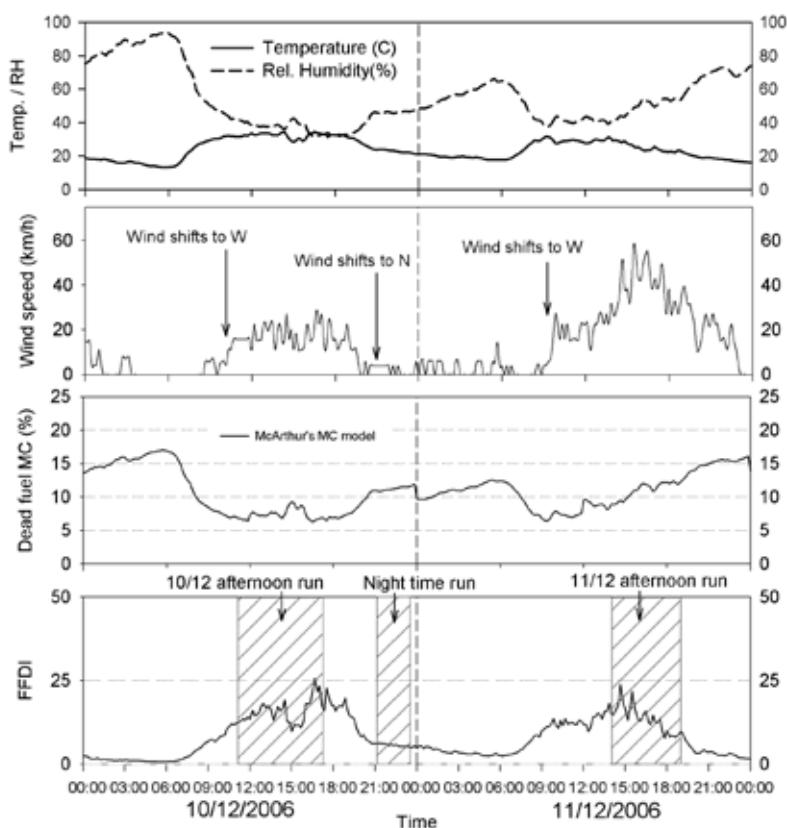


Figure 2. Diurnal trend of weather elements, fine dead fuel moisture content (MC) and the McArthur (1967) Forest Fire Danger Index (FFDI) for 10 and 11 December 2006. Weather data from Bondo weather station, operated by Forests New South Wales.

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Bushfire CRC is a national research centre in the Cooperative Research Centre program, formed in partnership with fire and land management agencies in 2003 to undertake end-user focused research.

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AFAC is the peak representative body for fire, emergency services and land management agencies in the Australasia region. Established in 1993, it has 26 full and 10 affiliate members.