

INDEPENDENT BUSHFIRE GROUP

Fire Study 3: Gaspers Mountain fire, south-west section

Issue: Strategic containment

Period: 05 -16 December 2019

Introduction

The purpose of this fire study is to highlight where strategic containment could have occurred using these considerations:

- recognising when, where and how various fire advantages in the landscape can be used to slow or even break up a fire's momentum and impact
- understanding how a backburn failure on the Newnes Plateau (outlined in Fire Study 4) led to a chain of events resulting in later fire blow-outs in the Wolgan and Lithgow valleys on 12 Dec and on 21 Dec
- prioritising Blue Mountains World Heritage values and fire frequency and severity of previous bushfires in fire containment planning.

The Gaspers Mountain fire became very large, complex and damaging when initial attack of a remote lightning fire did not succeed. It was reported as the largest single forest fire in Australia's historical record. The fire burnt for 79 days from 26 October 2019 to 12 January 2020 and covered 512,626 ha (including the distinct Grose fire). Many control strategies were used at different times in different places with mixed success.

The Mt Wilson Road fire (Grose fire) from the escaped backburn on the Mt Wilson Road burnt for 53 days and was declared out on 4 February 2020 with an official RFS estimate of final area of 19,896 ha. Our own analysis reveals that the fire actually burnt 63,700 ha of which 41,800 ha burnt the Grose Valley and 21,900 ha in the upper Wollangambe catchment. This was a completely separate bushfire and is separate from the Gaspers Mountain bushfire (see Fire Study 6).

This study examines the problematic south-western part of the fire from Capertee Valley to Mt Tootie. Either side of this zone the fire was successfully contained as it emerged from the Wollemi National Park and reached settled areas.

See map *Figure FS13*.

Situation

Important fire landscape features

- Limited fire advantages are available once the Glow-Worm Tunnel Road backburn failed in the northern Newnes Plateau.
- Surface, near-surface, and understorey fuel levels were low in the Wollangambe River and Dumbano Creek water catchments from the 2013 State Mine Gully bushfire.
- Bungleboori Creek was a significant fire advantage which had previously been used as a tactical fire advantage.

Seasonal dryness indicators

The Mount Soil Dryness Index (MSD) a week before in late November indicated that the soil water deficit in most forest and heathland soils had exceeded a value of SWD>140 mm on a scale of 0-165 in the middle Blue Mountains (see *Figure FS6*). This SWD threshold in most dry eucalypt forest types on the tablelands of NSW has been found to be associated with increased leaf mortality in understorey shrubs and eucalypt leaf drop, which can shed up to 40-60% of the eucalypt tree canopy (2-4 tonnes

of newly shed leaf litter). This recently shed litter is also highly flammable and combustible in a fast-spreading bushfire and adds to the existing surface fuel loads.

Fire weather patterns (see weather chart Figure FS14)

- Fire weather 'spike' days occurred on 12, 15 and 21 December, with some significant periods of less severe fire weather in between these events.
- Fire runs under west or south-west fire winds mirrored fire spread patterns of historical bushfires in 1979/80, 1997/98 and 2012/13 in the Wollangambe in a Sydney Basin fire season. Therefore, the Gaspers Mountain bushfire was not likely to progress south towards Mount Wilson and Mount Irvine.
- Fuel moistures recovered most nights to above 20% between 6 and 21 December except on 15 and 20 December when they rose only to 12-14%.
- Minimum DFMCs decreased to below 6-7% during most days because of a dry westerly airstream during this period, particularly in the higher parts of the Blue Mountains.
- Critically low DFMCs occurred on 6, 7, 14, 15, and 19 December combined with 10-m winds reaching 20-25 kph during the mid to late afternoon on these days.

Containment strategies

- It is not known for certain that the unattempted RAFT-natural advantage containment strategy from southern Newnes Plateau to Mt Tootie (*see map Figure FS13*) was the IMT's preferred plan, but it seems likely.
- This strategy would have utilised as advantages the gorge of Bungleboori Creek (which did actually stop the fire) and the low fuel area of the 2013 State Mine Gully fire that extended from Bungleboori Creek to Newnes Plateau.
- This strategy, if successful, would have saved a large area of burnt country and impacts on communities extending from the Capertee Valley in the north-west, through Lithgow and Clarence to Blackheath and Bilpin in the east.
- As noted in Fire Study 4, the Glow Worm Tunnel Road backburn did not succeed for uncertain reasons and, in Fire Study 5, the Mt Wilson Road backburn was an unwise strategy.
- The northern Glow Worm Tunnel Road backburn was a critical tactic in the overall strategy to contain the Gaspers Mountain bushfire.
- Later backburns failed in the Newnes Plateau area westwards, leading to the Gaspers Mountain fire running unchecked to the west and south-west, somewhat advanced by backburns.

Potential lessons

- Utilise fire advantages and tactical remote area fire-fighting work to limit fire spread south towards northern Blue Mountains townships.
- Timing of backburns is critical to fire containment strategies.
- Aerial incendiary work under benign conditions has proven to be a useful strategy in previous major incidents on the plateaux to the north of Mount Wilson and Bungleboori and Wollangambe Creeks. This can be used to play for time by bringing the active fire down from the ridges into the convoluted creek systems and where the active edges are more sheltered from eastward and southern movement.

Map notes (Figure FS13)

- The northern part of the map shows the initially successful containment from Glen Davis to Newnes Plateau. This containment linked a RAFT line from Glen Davis along the Pipeline Pass walking track to the Wolgan River and then via a 2017/18 prescribed burn in Rocky Creek to the northern end of Newnes Plateau.
- The eastern part of the map shows the successful containment via a backburn along Mountain Lagoon Road, Bells Line of Road and Mt Tootie Road to Mt Tootie (purple line labelled 'Completed backburn').

- Between these two successful containments the map shows the escaped backburns on Mt Wilson Road and Glow Worm Tunnel Road (green line labelled 'Backburn with low intensity fire' as the objective) and subsequent fire spread west and south to eventual containment at the edge of settlement.
- Between the green line and the purple line are two segments in orange (labelled 'Remote area fighting') and blue (labelled 'Containment by natural advantages'). This is the containment option that was not apparently attempted, as it was circumvented by the backburn escapes.
- Remote area firefighting (orange segment) could have linked the Glow Worm Tunnel Road backburn into Bungleboori Creek and then Bowens Creek (both blue segment) to the completed backburn near Mt Tootie.

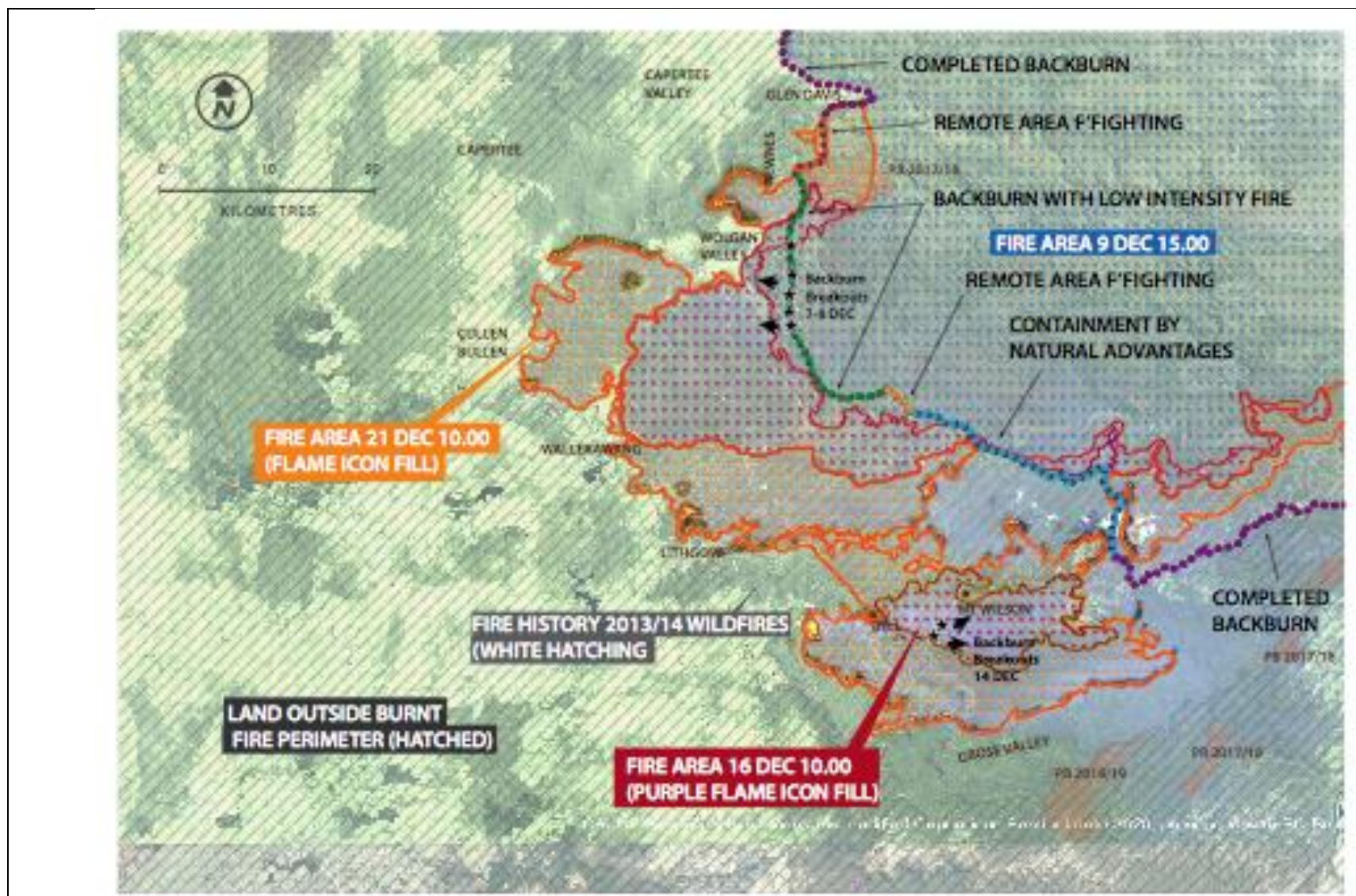


Figure FS13: South-western part of Gospers Mountain fire, showing final extent (green stippled line), Mount Wilson backburn escape (light purple stippled line), and strategies which failed or were not attempted.

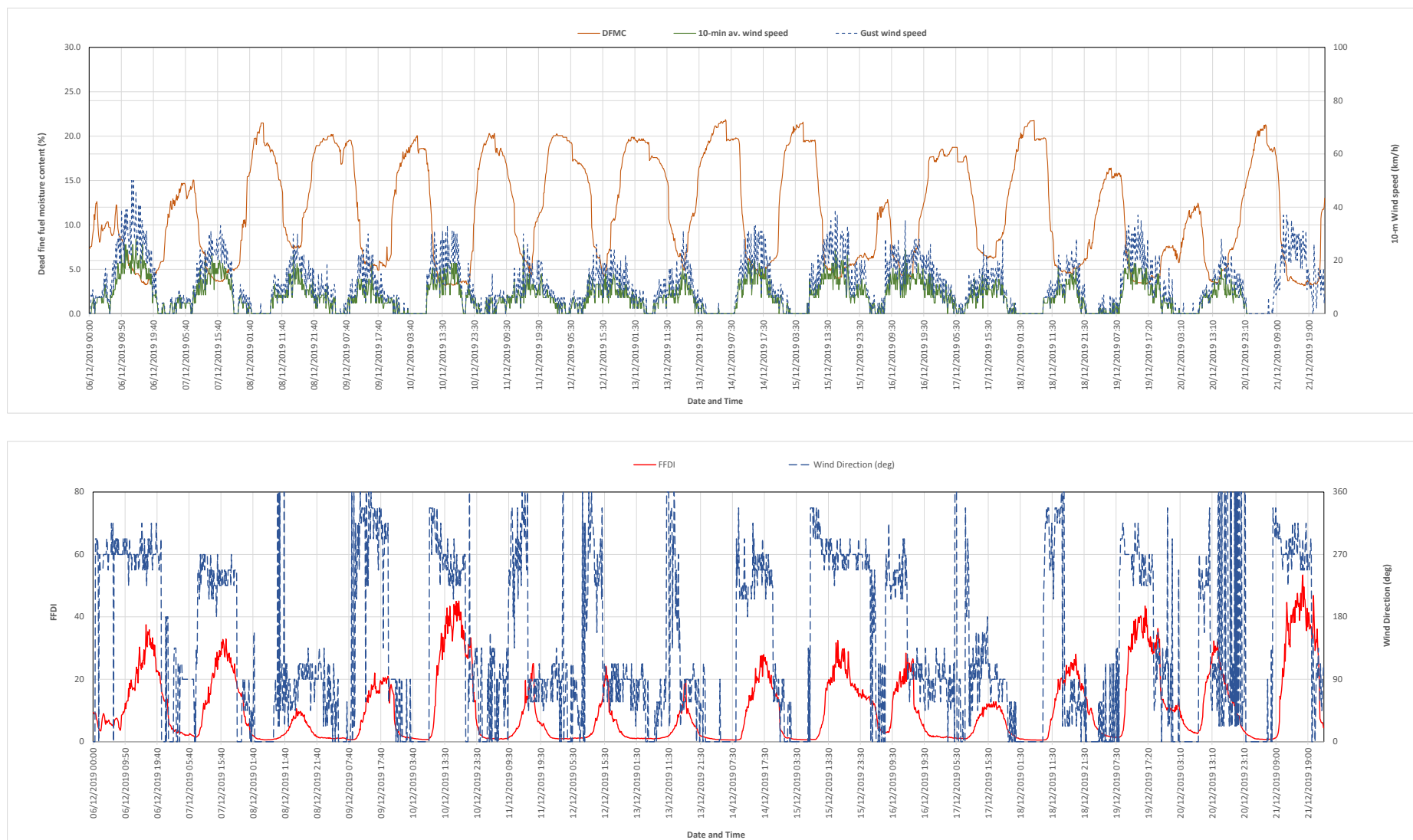


Figure FS14: Fire Weather – (a) DFMC and 10-m wind speeds (top panel) (b) FFDI and Wind Direction (bottom panel) for Marrangaroo AWS north of Lithgow, 6 Dec to 21 Dec 2019.

Fire Study Author

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Nicholas Gellie is a landscape ecologist and fire scientist with 37 years' experience in fire management, fire research, fire ecology, fire risk planning and vegetation mapping. He has an in-depth knowledge of landscape and bushfire processes in south-east Australia, having reconstructed over 100 major bushfires, including 2003, 2007 and 2009 (Black Saturday) in Victoria, 2003 in Canberra and 2019-2020 in NSW, as well as in Portugal and in California. He has undertaken many consultancies and published many scientific papers. He has worked extensively on fire behaviour analyses and the effectiveness of planned burning programs. He was a pioneer of community fire planning in NSW, has been involved in suppression strategies and aerial ignition for numerous wildfires and has planned and implemented many prescribed burns. From 2009 to 2014 he worked with Victoria's Department of Sustainability of Environment and the Bushfire CRC on analysing the Black Saturday fires. He was a key consultant to the House of Representatives Select Committee's inquiry into the 2003 Australian bushfires, *A Nation Charred*.