

INDEPENDENT BUSHFIRE GROUP

Fire Study 5: Gospers Mountain fire, Mount Wilson Road backburn (Grose fire)

Issue: Backburn Failure because of timing under SW dry air mass

Period: 14 – 16 December 2019

Introduction

The purpose of this fire study is to analyse why the Mount Wilson Road backburn failed when lit up under low fuel moisture conditions on 14 December 2019. The backburn was undertaken to contain the Gospers Mountain fire to the north. The backburn escaped eastwards and went on to cause substantial impacts. The escaped backburn was initially named as part of the Gospers Mountain fire and later the southern part (south of the Grose River) was named the Grose fire. This operational division has led to some confusion in media reporting and public understanding of the extent of the fire which came from the Mt Wilson Road backburn.

The Mt Wilson Road fire from the escaped backburn on the Mt Wilson Road burnt for 53 days. The Grose fire section had an official final area of 19,896 ha and was declared out on 4 February 2020. The rest of the area burnt by the backburn was absorbed in the official hectare tally of the Gospers Mountain fire. Our own analysis reveals that the escaped backburn fire actually burnt 63,700 ha of which 41,800 ha was in the Grose Valley and 21,900 ha in the upper Wollangambe catchment. This was a completely separate bushfire and we have not included its area in the stated extent of the Gospers Mountain bushfire in this report.

See map *Figure FS18*.

Situation

A backburn was conducted along the western side of Mount Wilson Road between 10:00 and 14:00 on 14 December under very dry fuel moisture conditions. As the west to south-west winds increased in strength and humidity fell through the middle of the day, spot-overs occurred from about 15:00 eastwards across the Mount Wilson Road. Another spot also landed south-west of Mt Wilson, within the planned containment lines but before the backburn reached that section. The northern-most fronts of the escapes then threatened property on Mount Wilson in the late afternoon.

Following a cooler easterly change between 18:00 and 18:30 the breakout to the east settled although the change started a westerly fire run towards Bell that nearly crossed the Bells Line of Road in the evening.

The fire weather deteriorated on 15 December resulting in some intense fire runs on the southern flanks of the Bowen Creek catchment. Property on Mt Tomah and in Beraming came under threat and some property was lost or damaged. After the fire crossed Bells Line of Road, it spread to the east, south and west in the Grose Valley. On 21 December during a severe-extreme fire weather day and subsequently, the fire impacted Bilpin, Kurrajong Heights, Blackheath, Mount Victoria and Bell (*see Figure FS18*).

Important fire landscape and fire behaviour features

- The eastern part of the southern front of the Gospers Mountain fire was holding in the deep gorge of Bungleboori Creek where it later self-extinguished and never crossed the creek.
- The western part of the southern front of the Gospers Mountain fire towards Newnes Plateau was burning slowly at 700-1,000 m per day southwards through light fuels (2013 wildfire) and broken rocky terrain in the headwaters of Bungleboori Creek. This part of the wildfire was merged with an earlier backburn on Newnes Plateau.

- The consequences of a fire crossing Bells Line of Road into the Grose Valley are well known.
- Several previous fires in the upper Grose Valley area have either been caused or exacerbated by escaped backburns.
- In 1994 a 'first response' backburn in almost the same location on Mt Wilson Road accelerated and extended a nearby arson ignition on Bells Line of Road. The fire became the damaging Bell Range fire (aka Grose Valley fire). In 2006 a backburn along Darling Causeway west of the 2019 event crossed into the Grose Valley on a multi-kilometre front, greatly expanding the actual wildfire.

Fire weather patterns (see Figure FS19)

- The broader temporal context for fire weather during the this backburn strategy depicts periods of more settled fire weather both before and after the backburn was carried out.
- The graphs presented in *Figure FS19* tell a reasonably consistent story about the fire weather conditions at the time of the backburn. There is no evidence of a change in the weather.
- On the day of the backburn DFMC decreased to 4-5%, latent conditions for a severe bushfire and potential spot-over across a containment line. The likelihood of short-range spotting from a backburn increases exponentially below a DFMC threshold of 6-8%.
- The forecast weather for the 15 December suggested worsening fire weather conditions and if the backburn failed there would be consequent impacts on people and property downwind of the fire, such as Berambing, Mount Tomah, and Bilpin.

Containment strategies

- The fire weather was settled in periods before and after the backburn escape. There was no imminent threat to be countered. The backburn was an appropriate strategy under the right circumstances but could have been abandoned at this time.
- Backburning has failed numerous times before along the Bell Range. It is a highly tricky strategy to implement because of the interaction between the local fire winds, fuel types and dissected topography on either side of the Mt Wilson Road and Bells Line of Road.
- The backburn strategy overlooked the state of low fuels in the Wollangambe and Dumbano catchments.
- The escaped fire went on to burn a large area, impact a number of communities and significant environments (including the Blue Gum Forest). It caused major damage to rail, road and electricity infrastructure. The fire absorbed a large resource commitment over many weeks (see Fire Study 6).
- The backburn was extended over following days around the northern side of Mt Wilson absorbing scarce resources needed elsewhere in the Blue Mountains.
- The Gaspers Mountain fire burning very slowly south and the backburn burning very slowly north from Mt Wilson never joined. The gap between them was eventually filled in by mainly the backburns burning northerly and easterly from the escaped Mt Wilson backburn in the lower Wollangambe and the backburns put in between Bell and Clarence burning eastwards into the upper Wollangambe.

Potential lessons

- Backburning is likely to fail if conducted while fuel moisture conditions are well outside safe backburn prescriptions (DFMCs between 10 and 15%, settled stable weather conditions).
- Avoid risky backburning when the threat is low and distant.
- Local knowledge and understanding of previous fire histories is essential for sound strategies.
- Backburning well away from the main fire represents a high-risk strategy with potentially catastrophic consequences to local communities downwind of the bushfire, especially carried out just before a major blow-up day without thorough mop-up and patrol for several days previously (ie blacked out). Not many firefighting crews are trained thoroughly in this technique. Not doing so can result in high-risk backburn failures like what occurred at Mt Wilson on 14 December.

- Backburning along roads at the intersection of three fire catchments, such as the Wollangambe, Bowens Creek and the Grose valley means escape into all three catchments is likely and resource intensive to suppress. This was also seen along the Kings Highway in Fire Study 9.
- Prescribed burns and past wildfires can assist bushfire suppression if recent enough and in suitable fire conditions.

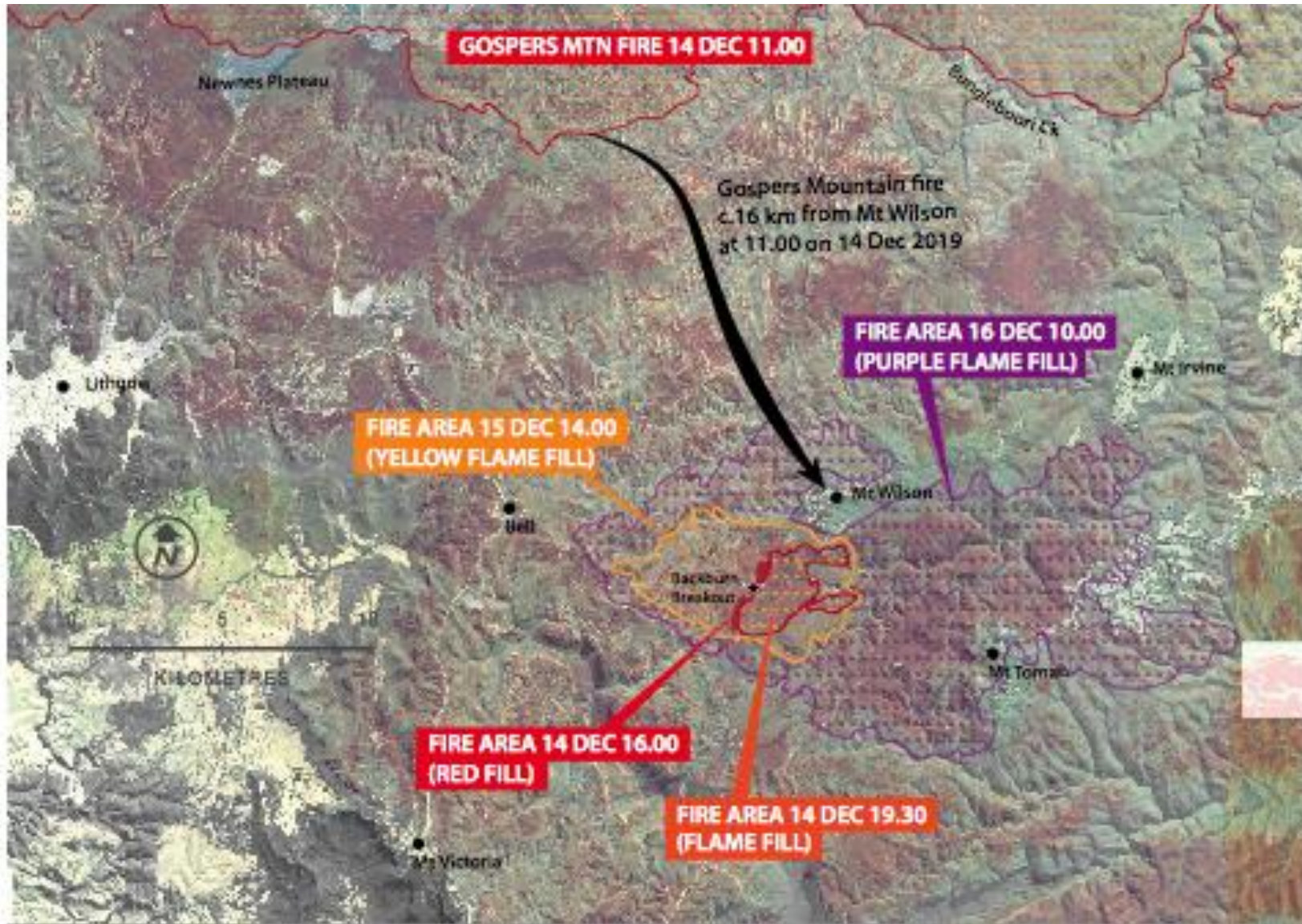


Figure 18: Progression of the Mt Wilson Road backburn 14-16 December 2019.

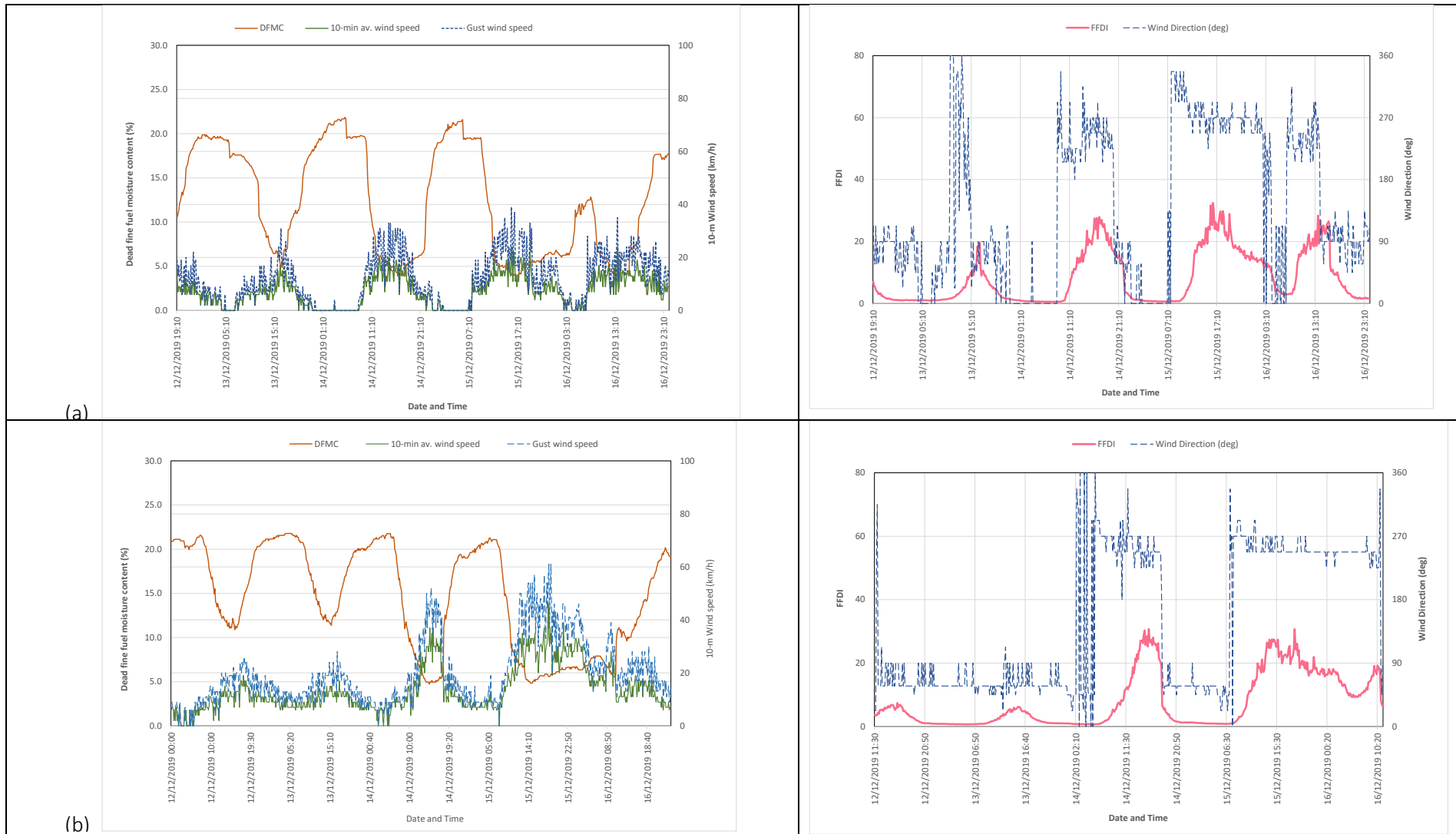


Figure 19: Fire Weather (DFMC and 10-m wind speeds 1st column) (FFDI and wind direction 2nd column) – 12 Dec to 16 Dec 2019 – (a) Marrangaroo AWS north of Lithgow (first row) and (b) Mt Boyce AWS (second row).

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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*.