

Expert Report

Coronial Inquiry into Gospers Mountain Fire and
Grose Valley Fire, Mt Wilson

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Captain Kurrajong Heights Rural Fire Brigade

4 May 2023

Contents

1. Introduction	3
2. Declaration	3
3. Background Information	4
3.1. The Kurrajong Heights Bushfire Management Plan	4
4. Cool Mosaic Pattern Hazard Reduction Burning saved Communities from the 14 December Escaped Mt Wilson Strategic Backburn	10
4.1. One of the few backburning operation not to escape and put more fire in the landscape. 11	
5. Hazard Reduction Program – A Recommendation from Government Inquiries that is Constantly Ignored	14
5.1. Removal of local control& increased bureaucracy has led to a decrease in cool burn hazard control 15	
6. Gospers Mountain Fire RFS Strategic Backburns	16
7. Issues for Stage 2 HearingsPoints 12, 13 and 14.....	17

1. Introduction

This report addresses Stage 2 Hearings Issues List, Backburning – GroseValley, Mt Wilson; points 12 ,13 and 14 regarding the RFS strategic backburn lit at Mt Wilson on 14 December 2019; and point 18) Responding to recommendations from the NSW Bushfire Inquiry. That is:

Recommendation 47: That in order to enhance firefighting strategies in severe conditions, the NSW RFS implement the following in respect to backburning:

- a) Establish protocols for each category (tactical and strategic) within their operational and training doctrines. These protocols should include lessons learnt from the 2019-2020 season.

- c) When fire conditions are approaching severe or above, an independent review must be undertaken at State Operations Level before strategic back burns are implemented.

Recommendation 48: That Government commission further research on the potential risks and benefits of backburning during severe, extreme, and catastrophic conditions and/or in particular terrain, that the NSW RFS use this research to inform future back burning protocols and training.

2. Declaration

I, **Brian Williams** acknowledge for the purpose of Rule 31.23 of the Uniform Civil Procedure Rules 2005 that I have read the Expert Witness Code of Conduct in Schedule 7 to the said rules and agree to be bound by it.

I rely on my experience of 54 years as a volunteer fire fighter, of which 37 years to present has been spent as Captain Kurrajong Heights Rural Fire Brigade. I served as Hawkesbury Remote Area Fire Fighting Team (RAFT) leader for 11 years.

I am an RFS qualified Group Leader and have fulfilled the roles of Incident Controller, Divisional Commander, Prescribed Burn Supervisor and Safety Officer on many occasions.

I am President of the Volunteer Fire Fighters Association (VFFA) <https://volunteerfirefighters.org.au/> and member of the National Fire Experts Group <https://www.nfegroup.com.au/>

I was a panel member on the Independent Hazard Reduction Audit Panel, a state government panel.

I have given expert evidence before the 2003 Federal inquiry - A Nation Charred, the 2010 Senate Select Committee on Agricultural and related industries into bushfires in rural areas, made submission to the 2019 – 2020 Royal Commission into National Natural Disaster Arrangements and a number of other inquiries dating back to the 1994 fires.

I served 24 days on the Gospers Mountain fire ground as a front line fire fighter, witnessing the size, the intensity, the destruction and the devastation caused.

3. Background Information

Kurrajong Heights, along with neighbouring village Bowen Mountain is regarded as a high bushfire risk in the bushfire prone Hawkesbury Local Government Area. Kurrajong Heights sits on top of a mountain range bordered by Blue Mountains and Wollemi National Park. The terrain is steep and has heavily wooded areas surrounding each community.

The Brigade holds a key location on the rim of the Blue Mountains range looking out over the Hawkesbury basin. Kurrajong Heights is at the mouth of a fire catchment area that feeds fires into North and Central Western Sydney. If a bushfire gets past this location, the RFS is forced to engage in urban firefighting; and it requires evacuations of villages and townships to east of the Hawkesbury River.

Kurrajong Heights has had a bushfire brigade for the past 70 years, and its history from fire management by First Nations people to the current day is documented in the book *Good Fire Bad Fire* (2022)

The Brigade has always been concerned with this grave responsibility and has endeavoured to stay abreast of changing methods and responses to management of bushfire in our natural environment.

To this end the brigade help found the Remote Area Firefighting Team (RAFT) and helped develop the methodology to fight fires in remote areas using helicopters to place firefighters in areas not accessible by fire tankers.

3.1. The Kurrajong Heights Bushfire Management Plan

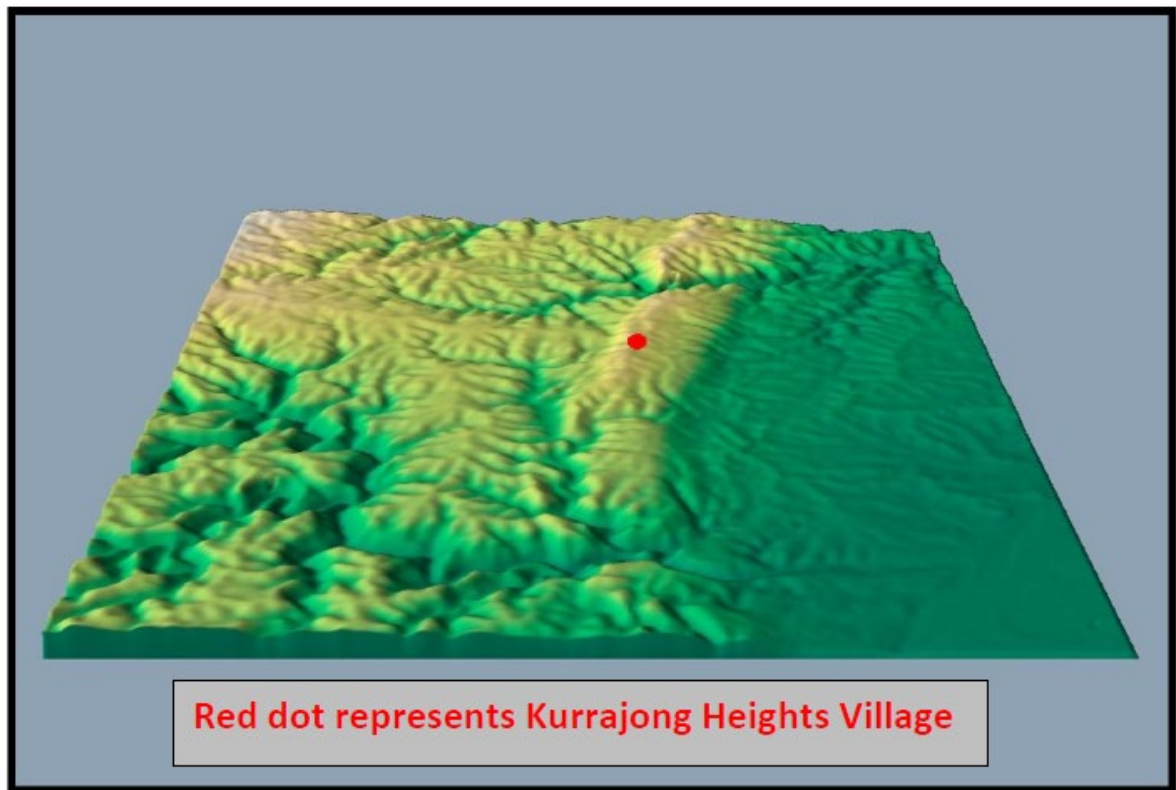
People and bushland can safely coexist if appropriate Bush Fire Management Plans (BFMP) are developed and implemented.

The Kurrajong Heights Brigade has developed and implemented a Bushfire Management Plan utilising extensive local knowledge of terrain and vegetation, fire behaviour and fire paths. This plan has kept the community safe for decades and has enhanced the local environment. We have a thriving ecosystem in which endangered species such a koala and powerful owls flourish.

Our plans principles could easily be implemented throughout the state.

To be successful, these plans must be developed by people with local expert knowledge of the surrounding environment. RFS bureaucratic influence has extended over the years to marginalise local community input and control of these plans as evidenced in Section 3 of this report.

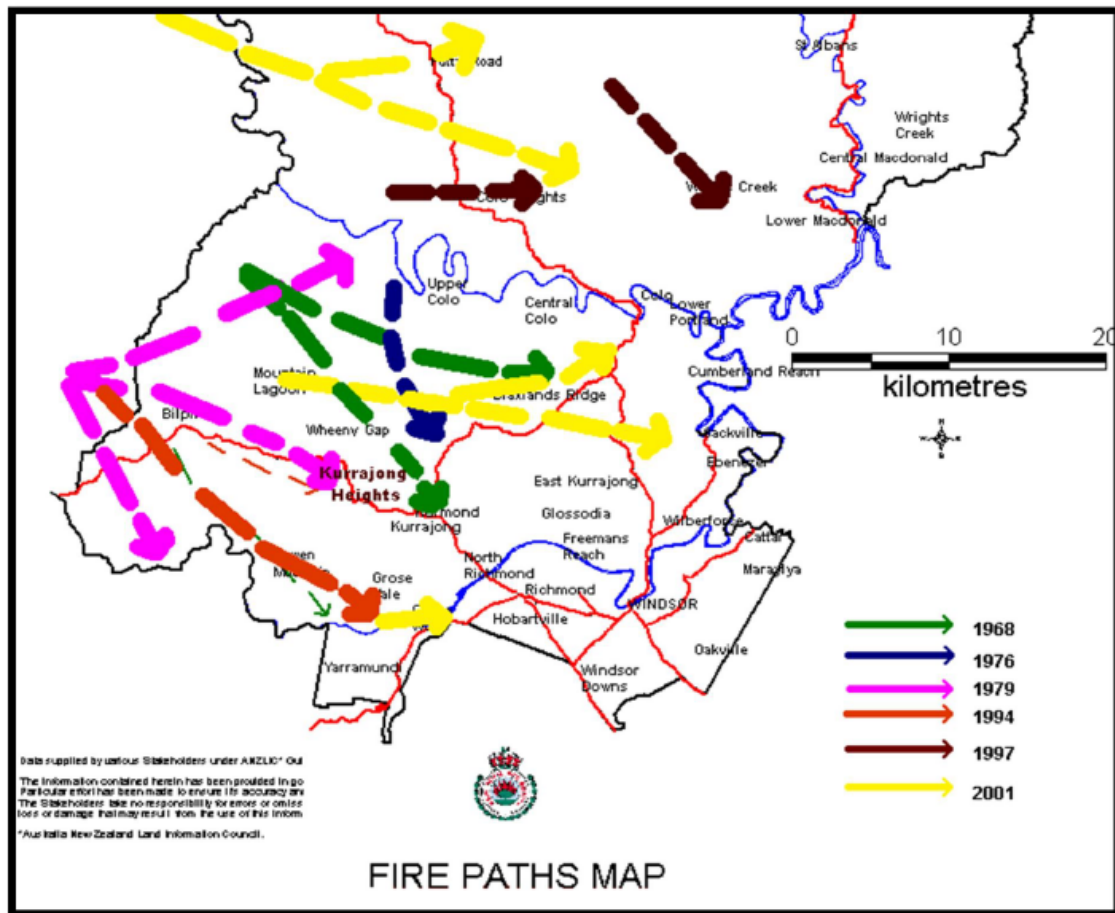
Kurrajong Heights sits on top of a mountain range surrounded by bush. This means all fire approaches are uphill into the village area which increases flame height and fire intensity. The red dot on Map 1 below shows the location of our village and our vulnerability.



MAP 1

This map shows Kurrajong Heights sitting between the Blue Mountains and Wollemi National Park comprising nearly three quarters of a million hectares of largely untouched wilderness. The terrain feeds fire over and between the mountain on which the village is located and down into the Hawkesbury basin.

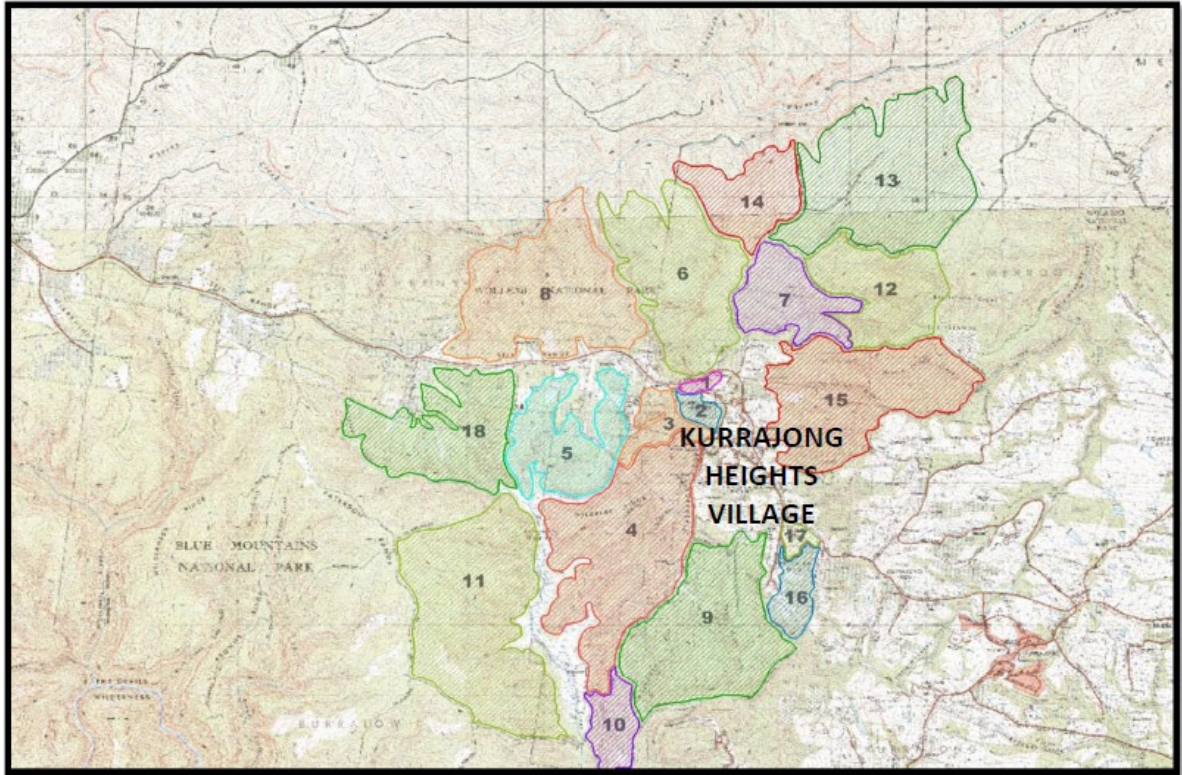
Historical patterns of wildfire originating from the National Parks are shown on Map 2 below.



MAP 2

This map shows the frequency to which Kurrabung Heights is subject to wildfire events.

The brigades' Bushfire Management Plan must address these key factors to successfully protect our community. To this end a hazard reduction burning method called 'mosaic burning' has been developed. This involves the rotational cool burning of blocks of bushland around the perimeter of the village during suitable conditions to reduce fuel loads. The Map 3 below is used by the community to determine the cycle of cool hazard reduction burning.



MAP 3

This burning is undertaken in accordance with RFS Standard Operating Protocol #1 Prescribed Burning Activities General. The aim of the burn is to burn fine ground fuels with a flame height of no more than one metre. The burn is done with enough moisture in the fuel to leave the humus layer unburnt. As it's the humus layer that protects from erosion. '



Image; Kurrajong Heights Brigade members conducting a prescribed hazard reduction burn

Burns are started at the higher elevations and burn downhill, so fire burns slowly and is less intense. These low intensity burns leave gullies unburnt as fauna retreat areas. The

low flame height, low intensity and slow progression of fire means that animals can safely retreat.

This cool burning hazard reduction helps protect our fauna and flora by ensuring the fire is slow enough for our native animals to escape to safety; and the heat intensity low enough to allow for the regeneration of existing flora species.

The aim of the prescribed burning is to reduce the number of fine fuels to a level that will not support a crown fire. This is in stark comparison to a wildfire that is hot, fast moving, impacting with devastating results. Wildfires burn down to mineral earth, removing humus. After rain erosion takes place with silt run off choking gullies and creeks, causing further environmental damage. The runoff also causes enormous problems for water catchments.

Areas burnt by wildfire are never the same, with biodiversity changed for a lifetime.

This occurred when the escaped RFS Mt Wilson strategic backburn scorching the landscape in the Blue Mountains National Park from 14 December 2019 and its impact of the landscape is seen in the area photo of Mt Bell taken after this fire.



Figure 1 - Mt Bell after being burnt by the Escaped Mt Wilson Backburn



Image: Kangaroo trying to escape the disastrous Wambelong Fire 2013 that burnt 95% of the Warrumbungles National Park

Our mosaic burning pattern means a fire arriving from any direction will encounter a previously burned block which will slow its progress, allowing us to extinguish the fire or light a tactical backburn if required.

The escaped Mt Wilson backburn fire crossed Bells Line of Road and entered country managed in our Bushfire Management Plan. The fire self-extinguishing on a 41-degree day with a strong southerly blowing in a 3 year old hazard reduction.

Our successful 20km tactical backburn extended from Bells Line of Road down across the Burrell Valley and down into the Grose River, protecting the villages of Kurrajong Heights and Bowen Mountain; and kept fire out of the Hawkesbury basin and Western Sydney communities.

4. Cool Mosaic Pattern Hazard Reduction Burning saved Communities from the 14 December Escaped Mt Wilson Strategic Backburn

Before a hazard reduction can take place a significant number of bureaucratic requirements must be met. Below is a chronology of events the Kurrajong Heights brigade went through to secure continuation of its BFMP and continue with our annual mosaic cool burning hazard reduction in the lead up to the December 14, 2019, escaped RFS Mt Wilson backburn fire.

1. In early 2018, the Stone Terrace Hazard reduction land block in our mosaic burn pattern was approved by the Hawkesbury Bushfire Management Committee. This was the block that was due for hazard reduction on our rotation schedule.
2. Once we had this approval, planning for the burn started and affected residents were spoken with and signed permission forms agreeing to the hazard reduction fire.
3. We then submitted this information to Hawkesbury RFS Fire Control Centre and requested a Hazard Reduction Certificate so we could commence the burn.
4. On 27 August 2018 we received a response to our request denying it. RFS staff had determined from viewing satellite imagery that wet sclerophyll forest was present in a section of our proposed burn area. Being intimately involved in care and preservation of our bushland we knew this was not the case and so asked the RFS to reevaluate the vegetation they had identified as wet sclerophyll forest.
5. On 5 November 2018 the RFS sent a representative to view the vegetation. His evaluation given orally and was not definitive suggesting it could be wet sclerophyll forest.
6. On 11 February 2019 the Brigade commissioned a report from a highly respected forester, academic and author Vic Jurskis to inspect the vegetation and determine whether it was wet sclerophyll forest. The report was paid for by the Brigade out of Brigade funds.
7. On 18 February 2019 the Brigade received the written report stating that the vegetation was not wet sclerophyll forest.
8. On 12 March 2019 the Brigade sent a letter with this report attached Hawkesbury Fire Control expressing concern over the delay determining our application for a Hazard reduction certificate.

9. On 4 April 2019 RFS Head Office sent their Chief Environmental Officer, a consulting botanist and three other RFS Officers to review the site. These people were accompanied by myself, and a Senior Deputy Captain to assist with identification of the site and the vegetation in question.
10. On 14 April 2019 the RFS sent a 17 page report made by this team of officials to the Kurrajong Heights Brigade stating they had determined the vegetation was not wet sclerophyll forest.
11. On 9 May 2019 over one year since commencing the process to continue with its annual cool mosaic hazard reduction burns permission was finally granted and Hazard Reduction Certificate provided.
12. The close onset of winter made it too cold to undertake the burn. Ideally this block of bushland is burnt in early Autumn.
13. On 3 August 2019 the Stone Terrace hazard reduction burn took place.
14. On 14 December 2019, the RFS lit a strategic backburn. When this escaped backburn crossed Bells Line of Road introducing fire into the Grose Valley and to Kurrajong Heights. Our Stone Terrace hazard reduction provide safe egress for residents west of Kurrajong Heights and protection to the local koala colony and other fauna and flora in our community.
15. On 21 December 2019 a catastrophic fire day, this out-of-control strategic backburn hit our mosaic burning containment area and the fire was starved for fuel and self-extinguished saving Kurrajong Heights village.

4.1. One of the few backburning operation not to escape and put more fire in the landscape.

On the 21st December 2019, the Gospers Mountain Fire devastated Bilpin and the western section of Kurrajong Heights. Bilpin is the suburb immediately to the west of Kurrajong Heights. Simultaneously Kurrajong Heights had fire to the north and south, as well as west on that day and our bushfire management plan worked keeping our village safe. This was in sharp contrast to the RFS prediction that Kurrajong Height would be completely overrun by fire on that day.

On the 22nd and 23rd December 2019 I oversaw a 20km tactical back burn from Kurrajong Heights south from the Bells Line of Road to the Grose River which stopped the Eastern progression of the fire.

This back burn was successful for a number of reasons.

Firstly the burn was overseen by the local Captain with 54 years fire ground experience in the area.

The Brigade has previously hazard reduced the area as part of our mosaic fire plan, and knew how fire behaves in the area. This knowledge and expertise allowed the Brigade to implement burning patterns for successful containment within the lit perimeters. These burning patterns, such as lighting on the ridge tops and letting it burn slowly back down to the containment line, meant that we had low flame height and more control of the fire. The area back burnt was steep, difficult country with an elevation difference of up to 204 metres.

The back burn was conducted within the mosaic pattern. This was crucial as it meant that we were back burning in areas with reduced fuel. Making it significantly safer for fire fighters.

Crews experienced with hazard reduction burning and back burning also contributed to successful lighting.

The weather on the day and days post burn made it conducive to implement the burn.

Blacking out and patrolling for several days post burn is something that the Kurrajong Heights Brigade prides itself on.

This tactical backburn stopped the escaped Mt Wilson strategic backburn impacting on the villages of Kurrajong Heights and Bowen Mountain, protecting more than 1,000 homes and kept fire front breaching the top of mountain and running down into the Hawkesbury basin.



Back burning at Kurrajong Heights on 22nd December 2019 to stop the progress of the Eastern edge of the Gospers Mountain Fire Page 13 of 21 Mosaic Burn Pattern The brigade reduces fuel by the hazard red

5. Hazard Reduction Program – A Recommendation from Government Inquiries that is Constantly Ignored

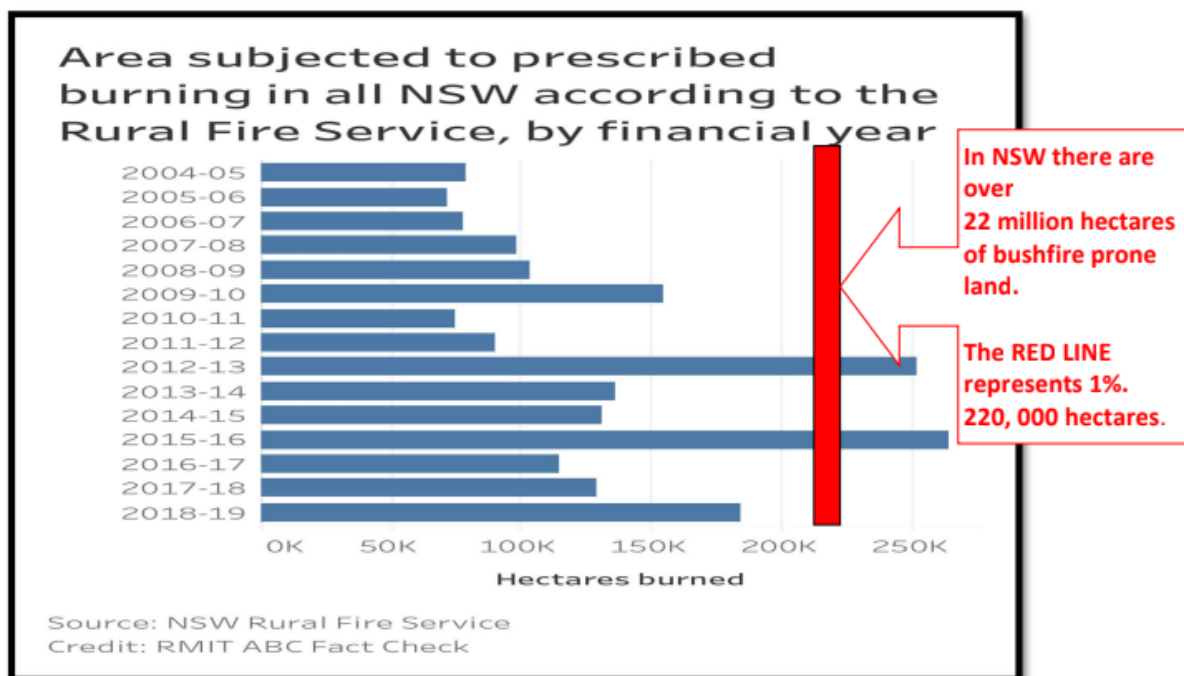
The Australian Government has held 18 major inquiries into bushfires since 1939. The 1939 Stretton Royal Commission highlighted that the lack of hazard reduction burning was a major contributing factor to the severity of the fires as has every inquiry since.

The Australian Government 'A National Charred Inquiry' (2003) stated "*The Committee heard a consistent message right around Australia:- there has been grossly inadequate hazard reduction on public lands for far too long*".

The Victorian Bushfires Royal Commission (2009) went further recommending a minimum of 5% of all fire prone lands be treated annually.

Over the last 20 years, NSW has averaged less than 1% of fire prone lands treated annually. In practical terms this means that it would take 100 years to treat our fire prone lands just once.

The graph using figures supplied by the RFS demonstrates the amount of hectares being hazard reduced in NSW. NSW has over 22 million hectares of bushfire prone land, so 1% = 220,000 hectares. The vertical red line at 220,000 hectares demonstrates that we are averaging much less than the 1%, let alone the 5% recommended by the Victorian Royal Commission.



5.1. Removal of local control& increased bureaucracy has led to a decrease in cool burn hazard control

The NSW National Parks & Wildlife Service has not conducted enough hazard reduction burns to preserve the Blue Mountains and Wollemi National Parks. In the 1980's and 90's during suitable weather, hazard reduction burns were conducted on a 7 to 8 year cycle by local brigades in collaboration with Park Rangers.

The removal of planning and decision making from this local level by NPWS and the RFS to centralised offices has marginalised the input of local skills and knowledge in fire planning and management.

Now under the bureaucracy of the RFS and the NPWS, our time frame has cool burning hazard reduction has been blown out to 10 to 20+ year cycles. This longer cycle is producing poorer environmental outcomes and putting the community at far greater risk. The reasons given for this extended time frame is compliant with a raft of regulations including:

- The Bushfire Environmental Assessment Code
- Biodiversity Conservation Act 2016 Part 4 - Threatened Species and threatened ecological communities.
- EPA regulations

While there is acknowledgement of the good behind these regulations the combined impact of their making cool hazard reduction overly cumbersome to enact is causing environmental destruction, the opposite of their objective.

When we compare the Kurrajong Heights fire managed area to the National Park approximately 15 km to our west, between Mt Tomah and Bell the environmental devastation is obvious to the casual observer. This area receives next to no hazard reduction and suffers periodic burning by wildfire. As a consequence, the Mountain Ash has virtually been eliminated and most of the big trees are now gone. This area has been changed forever and is now thick scrub. Because the scrub is more compact it burns hotter in shorter timeframes thus increasing the frequency and intensity of wildfire.

I note that as a result of the NSW Bushfire Inquiry 2020 a simplified code and user-friendly application has been made in response to boundary clearing regulations that hindered bushfire management. This same critical thought needs to apply to the regulations governing hazard reduction.

6. Gaspers Mountain Fire RFS Strategic Backburns

I spent 24 days on the Gaspers Mountain fire ground in November and December 2023. During this time, I observed the following:

Strategic backburning operations being implemented were in breach of the RFS Operational Protocols for Backburning. These breaches are listed below:

- Lighting backburns during the day rather than at night.
Lighting at night has a far less chance of escaping. The heat of the day has dissipated and you can clearly see the progress of the fire and more easily identify containment line spot overs.
- Strategic back burns were being put in during high to severe fire danger ratings weather conditions with extremely low fuel moisture content making controlling the burn very difficult, causing an inability to contain the fire and therefore an unsafe working environment for fire fighters. In principle I do not support introducing more 'strategic' fire under these weather conditions. It's best to keep the fire as small as possible.
- Poor lighting techniques used by inexperienced crews.
Strip lighting ignition patterns causing more intense fire quickly, with higher flame height and greater heat intensity making controlling the fire very difficult to control.
- Lighting from roads (hard lines) meant sometimes lighting at the bottom of hills increasing the fire intensity. Aerial ignition from the ridge top could have been an alternative. Fire could have burnt downhill to the road. RFS need to introduce the use of drones to solve this problem.
- Not having sufficient resources to control or contain the size of the backburning operations.

In short, this breach of protocol endangered fire fighters' lives, destroyed the environment, devastated native animal and plant species and continued to introduce fire into the landscape with little to no benefit to containing the Gaspers Mountain wildfire.

Gaspers Mountain Strategic Backburns benefit was not hazard reduction

During my time on the fire ground there were general comments words to the effect "This is our hazard reduction done for the next several years".

This is extremely concerning because the devastation caused by the strategic backburns goes against all the principles of hazard reduction.

Hazard reduction burns are prescribed, low intensity fires that enhance and protect the environment. They increase biodiversity and dramatically reduce the likelihood of wildfire.

The rule of thumb is if you double the fuel load, you double the rate of spread AND quadruple the intensity of the fire.

The impact of these Gospers Mountain strategic backburns on fauna and flora in our National Parks would be catastrophic in places as evidenced by Mt Bell where the back burn left nothing but scorched earth.

7. Issues for Stage 2 Hearings Points 12, 13 and 14

POINT 12

What containment strategies were considered to control the spread of the southern edge of the Gospers Mountain fire in the period up to 12 December 2019 and how did such strategies fit within the wider context of responding to other fire edges for the Gospers Mountain fire along with other fires burning within the State?

The strategy implemented was strategic back burning ahead of the fire to protect assets. To my knowledge this same strategy was used across all fire edges.

This strategy worked in areas of reduced fuel load and where the fire edge was constantly extinguished as the back burning progressed.

In principle I do not support lighting strategic backburns in bad fire weather. A better outcome would be achieved by lighting tactical backburns only when property is under direct threat.

POINT 13

What prompted a change in the Southern Containment Strategy on 13 December 2019 and was the change reasonable in the circumstances?

To my knowledge the strategy changed due to forecast weather conditions and the location of the Newnes Plateau fire. If this fire got into the Grose Valley 65,000 people living in the villages along ridge tops were at risk of having fire impact their homes.

POINT 14

How was the Southern Containment Strategy implemented on 14 December 2019 (including timing, ignition pattern, resources and monitoring) and what led to the initial introduction of fire to the east of Mount Wilson Road.

My answer is set out below:

- The timing of the backburn was 10am in the morning meaning that ignition was occurring at the same time the day time air temperature was heating up.
- The ignition pattern varied but included strip lighting that I have observed in photos. This ignition pattern increases fire intensity and therefore increases the likelihood of fire escaping containment lines.
- Resources were insufficient as exemplified by the strategic back burn escaping containment lines only 5 hours are being lit.
- Further this escape was in the heat of the afternoon with a high fire danger rating and into areas where there was a 24 year build up of fuel.
- Monitoring occurred but there were insufficient resources to contain the escape and prevent the strategic backburn from becoming a large bushfire that would go onto over run our communities of Mt Wilson, Tomah, Berambing, burning down people's homes the day after it escaped containment lines; and then a week later after the RFS continued to failed to bring it under control. On 21 December it burnt out properties in Bilpin District destroying homes threatening Kurrajong Heights and Bowen Mountain villages and escape into the Hawkesbury basin. By this time this escaped back burn was also causing the same destruction to the villages of Bell, Dargen, Mt Victoria and Blackheath.
- The initial introduction of fire in the Grose Valley I believe was from the Mt Wilson strategic backburn.

There was no need to light the strategic backburn until the Gospers Mountain Fire breached the natural containment line of Bungleboore Creek, which it never did.

In my lifetime, 2 x previous attempts to do this strategic backburn has failed at the junction of Bells Line of Rd and Mt Wilson Rd (1979 and 1994). Local knowledge knew this.

Alternative strategies manage the threat of fire entering the Grose Valley on 13 December 2019

A less radical approach by not lighting another strategic backburn would have likely resulted in much better outcomes. In relation to the threat posed to our communities by the Gospers Mountain wildfire a wait and see approach as set out on the Incident Action Plan 12th and 13th December. The wildfire did not cross the natural containment line of Bungleboori Creek so the need for a strategic or any back burn was not necessary.

In relation to the threat posed by the Newnes Plateau fire and stopping this fire entering the Grose Valley:

- Back burning should have been done of a night
- Burning should have been down hill from Mt Wilson to Bells Line Road not up hill to the Mt Wilson.
- Once fire crossed to the east side of Mt Wilson road as it did on 14 December then a night backburn should have been put in around Mt Tomah ad Berambing to the north of Bells Line of Road to give these communities and some protection from escaped RFS backburn as it burnt through 20+ year old fuel loads.

POINT 18

What if any response has there been to the following recommendations from the NSW Bushfire Inquiry: Recommendation 47: That, in order to enhance firefighting strategies in severe conditions, the NSW RFS implement the following in respect to backburning:

- a) Establish protocols for each category (tactical and strategic) within their operational and training doctrine. These protocols should include lessons learnt from the 2019-2020 season.*
- b) Modify 'ICON' to implement the capability to record all backburns, including whether or not they break containment lines;*
- c) When fire conditions are approaching Severe or above, an independent review must be undertaken at State Operations Level before strategic backburns are implemented; and*
- d) Where there is significant concern within a community regarding a backburn, the NSW RFS should undertake a community engagement session with affected residents to discuss the backburn, including any investigation and relevant findings.*

Recommendation 48: That Government commission further research on the potential risks and benefits of backburning during severe, extreme and catastrophic conditions and/or in particular terrain, and that the NSW RFS use this research to inform future backburning protocols and training.

There is no need for further research, what is required is the RFS implement its own backburning protocol.

No further research is going to reverse the basic scientific principles that have led to the development of these existing protocols. And the evidence of the strategic back burning strategies implemented to contain the Gospers Mountain wildfire shows the destruction that breaching these protocols causes to our environment and our communities.

These protocols have arisen from recommendations of past inquiries and seeking to overturn to allow or justify the use of strategic back burns in high fuel loads and/or bad weather conditions, denies the evidence of the dangers caused by this approach to fire fighting.

What is required is an oversight body to ensure implementation of recommendations made in any inquiry relating to the RFS and National Parks and Wildlife Services so that we can monitor for continuous improvement in our management of fire in the landscape instead of going backwards as we are now.

To move forward and produce better outcomes for the people and the environment, I recommend that all risk management plans include the recommendation of the Victorian Royal Commission that a minimum of 5% of all fire prone lands be treated annually by prescribed burning. Because most current fire risk management plans aren't working.