NSW INDEPENDENT BUSHFIRE INQUIRY

Submission
by
Brian Williams
Captain (35 years)
Kurrajong Heights Rural Fire Brigade

Image: Blue Mountains National Park, Bilpin. Taken 6th January 2020

2019/2020

I have pleasure in presenting this submission and would appreciate the opportunity to give verbal evidence to the inquiry.

My name is Brian Williams. I have 52 years experience as a Volunteer Fire Fighter and I am the current Captain of Kurrajong Heights Rural Fire Brigade, having held the position for the last 35 years. My service has been continuous and remains ongoing, including a 28 day commitment to the Gospers Mountain Fire.

The evidence I am presenting is based on practical frontline bushfire experience and bushfire science.

Kurrajong Heights (along with the adjoining suburb Bowen Mountain) is regarded as the greatest bushfire risk in the Hawkesbury Area. Kurrajong Heights sits on top of a mountain range bordered by Blue Mountains National Park and Wollemi National Park. Our terrain is steep and has heavily wooded areas surrounding our population.

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

Kurrajong Heights has a highly successful BFMP that has kept the community safe for 68 years. The Kurrajong Heights BFMP relies heavily on local knowledge. Knowledge of terrain, fire behaviour and fire paths.

The Kurrajong Heights Brigade has developed and implemented a plan that hazard reduces blocks using a mosaic pattern. This strategy keeps low fuel areas as a blocking influence for approaching wildfire.

Whilst many deny that fuel reduction works, Kurrajong Heights survived the catastrophic fire day on the 21st December. A day that the RFS predicted Kurrajong Heights would be completely over run.

The following submission demonstrates why the Kurrajong Heights BFMP worked. And how our community and the environment (including our beloved koala colony) were protected.

The submission also details how this proven successful strategy can be rolled out across the state.

I am proud of the superior environmental outcomes produced by the brigade's fuel reduction strategy and would have great pleasure showing the Committee around Kurrajong Heights at their convenience.

Yours sincerely,
Brian Williams.
Email: [redacted]
Phone: [redacted]

1. Causes of, and factors contributing to the frequency, intensity, timing and location of, bushfires in NSW in the 2019-20 bushfire season, including consideration of any role of weather, drought , climate change, fuel loads and human activity.

There has been exhaustive research conducted on bushfires by the CSIRO, bushfire scientists, bushfire centres, universities and fire agencies.
The body of knowledge is extensive and it is well established that fire runs on fuel.
Whilst other variables such as temperature, slope, wind, drought, etc do contribute, it remains that the main contributing factor to the intensity of fire is fuel loads.

You may hear evidence that hazard reduction burning does not work.
This need to be examined in the context of underlying agenda/s.
I have no underlying agenda.
My evidence is based on fire science along with my observation and vast experience amassed during 52 years of frontline fire fighting.
My agenda is to protect my community, my environment and my fellow fire fighters.
My agenda is to present a practical proven strategy to protect us all.

I've spent my whole life in the bush and have an immense respect for the environment.
The bush is part of who I am.
The amount of death and destruction that was allowed to take place in the 2019-20 fire season was immoral.
I witnessed pristine environments be incinerated, knowing that that they will never again be the same.
Large canopies were destroyed, massive numbers of animals were killed, and those that managed to survive - endured suffering and starvation.
It is neither an ethical nor sustainable way to manage our land.

The current land management practices cannot be allowed to continue.
Fuel is being left untreated, allowed to build to levels that supports fire than mankind cannot extinguish.
Preventative fuel reduction means that fuels can be kept to a level where fires can be easily managed and subsequently extinguished.
Preventative strategies are superior to reactive strategies in every way.
They offer a safer working environment for fire fighters, superior environmental outcomes, and enhanced protection of the community, and it's assets and infrastructure .

If the best we can offer people is to "Leave their Homes early", something has gone spectacularly wrong.

FIRE SCIENCE FUNDAMENTALS

Two fire science fundamentals which must be discussed are the fire triangle and fire intensity/fuel graph.
They are fundamental in understanding how fire is sustained and how fuel loads exponentially affect fire intensity.
Once these fundamentals are understood, there can no longer be any ambiguity as to how the landscape must be managed for fire.

THE FIRE TRIANGLE

The fire triangle shows that fire requires three elements - Fuel, Oxygen and Heat.
Without all three elements a fire cannot be sustained.
We cannot alter the oxygen component of the triangle.
Under general conditions we cannot alter the heat/temperature component of the fire triangle.
The only factor mankind can control is the fuel.

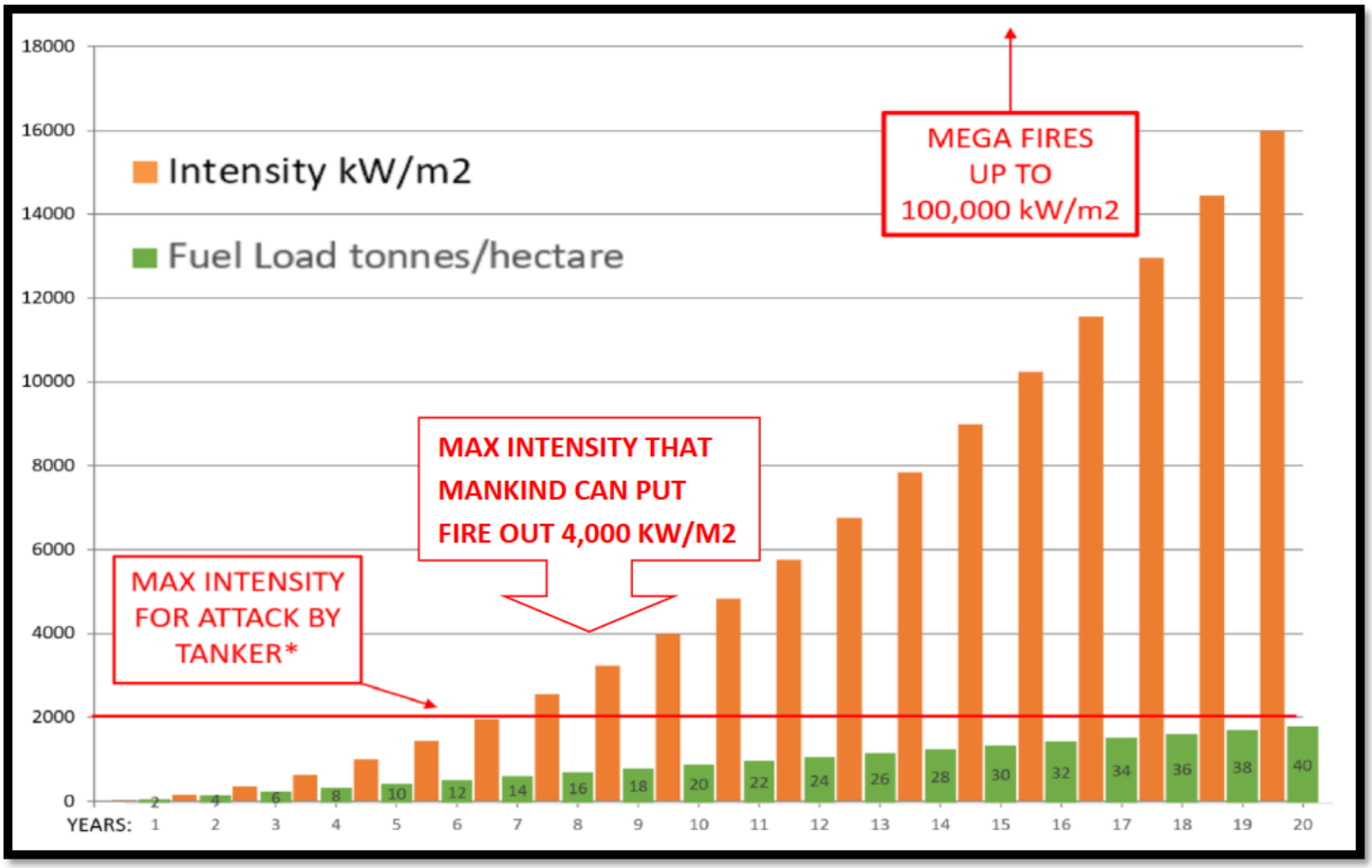
The heat/temperature component of the triangle causes many disputes.
I've heard many arguments that the rise in heat/temperature has been the main reason for these devastating fires, but this theory is clearly flawed.
My front line fire fighting observations confirm the view held by leading bushfire scientists, that a couple of degrees in ambient temperature has an insignificant effect on fire behaviour.
They cite an excellent example - there are no major fires in central Australia where we have the hottest driest climate - simply because there is not a lot of fuel.

Large fires will be sustained if there is enough fuel - even in low temperatures.
In the winter of July 2015 a fire emergency Section 44 fire started in the Blue Mountains at Wentworth Falls, two weeks after a heavy snowfall.

Without question, substantial research and evidence demonstrates that fuel is the main contributing factor of the fire triangle.

THE FIRE INTENSITY/FUEL GRAPH

Decades of extensive research demonstrates that fires run on fuel.
And that fire intensity grows exponentially, according to the amount of fuel.



*https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireInfoNotesPublications/DFES-InfoNote-ForestFuelLoadsinUrbanInterface.pdf

In Australia, fuel load increases by an average of 2 tonnes per hectare per annum.
Fire intensity increases exponentially;

- Fuel loads at 3 years can self extinguish.
- Fuel loads at 5 years can be easily managed.
- Fuel loads at 7 years produces 2,000kW/m2, the maximum intensity for attack by a tanker.
- Fuel loads at 10 years produces 4,000kW/m2, the maximum intensity that man can extinguish using all available resources, including aircraft.
- Fuel loads at 16 years produces over 10,000kW/m2.
- Fuel loads at 20 years produces 16,000kW/m2.

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

The Gospers Mountain Fire is a case in point.
This fire was started by nature, with a single lightning strike.
Because of the excessive fuel loads this fire could not be put out. It grew to the largest fire in the world caused by a single lightning strike.
It lasted 79 days despite the enormous amount of resources deployed. This included thousands of fire fighters, large amounts of fixed wing aircraft dropping fire retardant and water bucketing helicopters.

In contrast, when the same Gospers Mountain Fire crossed the Bells Line of Road at Kurrajong Heights on the catastrophic fire day, 21st December, it self-extinguished in 3 year old fuel. This 3 year old hazard reduction saved the Kurrajong Heights Village of approximately 500 homes.

Disappointingly fuel loads have been so mismanaged that some recent fires have registered an intensity of 100,000kW/m2.
100,000 kW/M2 is equivalent to 100,000 single bar radiators stacked on top of each other for each metre of fire front.
At this temperature everything is incinerated.

2. The preparation and planning by agencies, governments, other entities and the community for bushfires in NSW, including current laws, practices and strategies, and building standards and their application and effect.

The duration, spread and intensity of the 2019-20 fires in NSW has clearly demonstrated that the current practices and strategies are not working.

The incineration of 5.3 million hectares, the death of 25 people (including 6 fire fighters), the loss of 2,439 homes and an estimated 480 million animals is simply not sustainable.
And this record of destruction doesn't even begin to measure the enormous human cost.
The impact of this fire will last for many years, with some unable to ever recover.

It is a negligent way to manage our environment and protect people.

Bureaucracy, 'red' and 'green' tape are preventing proven, successful land management practices to be implemented.

When the brigade was under local government control, we used to burn on a 7 to 8 year cycle.
Now under the bureaucracy of the RFS and the NPWS, our time frame 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 longer cycle is the result of a multitude of environmental laws including;

- The Bushfire Environmental Assessment Code (a 28 page document)
- Biodiversity Conservation Act 2016
  Part 4 - Threatened Species and threatened ecological communities
- EPA regulations

I understand the good intent behind the laws and regulations, but they are causing immense environmental destruction and death.
The exact opposite of their intended purpose.

Case example - <u>Stone Terrace hazard reduction</u>

The Stone Terrace hazard reduction is a crucial block in our mosaic pattern bush fire management plan.
It protects the eastern escarpment of the mountain.
But more importantly it protects the Bells Line of Road, one of only 2 roads out of the Blue Mountains. It is the only egress off the mountain for residents of Kurrajong Heights, Bilpin, Berambing, Mount Tomah, Mount Wilson, Mount Irvine and beyond.

It took more than 2 years for the Stone Terrace hazard reduction approval to be given.

And although finally approved, the brigade was unable to implement the burn as it did not comply with the Bushfire Environmental Assessment Code.
The area to be hazard reduced was identified as wet sclerophyll on the vegetation mapping and could therefore not be hazard reduced at that time, causing a unacceptable delay.
The delay is because the Bushfire Environmental Assessment Code states that wet sclerophyll cannot be burnt under a 15 year timeframe.

The brigade did not agree that the area had wet sclerophyll areas and believed that the delay was putting us at an immediate and unacceptable risk.
Fuel loads were already significant enough to carry a catastrophic fire on a bad fire day. And most residents in the area have a 100 metres of elevation fuels below them, making the situation even more dire.
Vegetation mapping is done by satellite and is not often ground truthed. This makes vegetation mapping an unreliable tool for fire management.

The brigade had been burning this area for the last 68 years and the area had never been identified as wet sclerophyll.
The brigade did not believe it was wet sclerophyll and after several emails with the FCO, an RFS Environmental Officer was sent to evaluate the area.
His report thought that it was "likely wet sclerophyll' and the FCO had no option under the current legislation but to postpone the HR.

The brigade was well aware of the approaching 2019-20 bad fire season and in an attempt to protect our community, our environment and our koala colony decided to do something never done before.
The brigade commissioned an independent expert at our own cost to evaluate the area.
The independent expert confirmed the brigade was correct and the RFS assessment was wrong.

The RFS then sent their Chief Environmental Officer, a consulting botanist and 3 other RFS staff to evaluate the area again.
The group took 2 weeks to write a 17 page report, which confirmed that it was not wet sclerophyll. And the brigade was finally given permission to proceed.

This meant that a simple hazard reduction that the brigade had been successfully implementing for 68 years turned into a costly and time wasting exercise.

The hazard reduction was implemented in August 2019, just months before the Gospers Mountain Fire imminently threatened.
Residents were relieved that the burn was implemented. And equally angry that bureaucrats and environmental legislation formulated by people with no interest in Kurrajong Heights would potentially threaten their lives and their homes.

5. Preparation and planning for future bushfire threats and risks

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7. Appropriate action to adapt to future bushfire risks to communities and ecosystem

Planning AND appropriate action is the key to managing bushfire risk.
Planning is of no use unless it is acted upon.

The Kurrajong Heights RFB has developed and implemented a proven successful plan that despite our extreme fire risk has protected our community and our environment for the past 68 years.

The success of this plan means that Kurrajong Heights has an excellent flora and fauna biodiversity with a tall tree canopy and low open scrub.
The tall timber canopy helps retain year round soil moisture, aiding in humus formation and soil improvement.
We have a thriving ecosystem in which endangered species such as koalas and powerful owls flourish.
The brigade is proud of the superior environmental outcomes produced by the brigade's fuel reduction strategy and I would have great pleasure showing the Committee around Kurrajong Heights at their convenience.

We believe that other brigades can use our principles to create a plan that suits their area.
And that these strategies can be easily rolled out across the state.
Locals developing and implementing their own plan, with their district fire control centres providing the support needed to accomplish the plan.

There are over 2,100 rural fire brigades in NSW.
If the power and authority was given back to the brigades, as it used to be under local government, superior protection of the community and the environment would be achieved.
Having a centralized bureaucracy overseeing the entire state has clearly not worked.
Having each of the 2,100 brigades look after their own area simplifies a huge problem.
Volunteers make up over 98% of the service, they need to develop and implement fire mitigation practices that directly affect them.

The following pages outline the Kurrajong Heights Bushfire Management Plan.

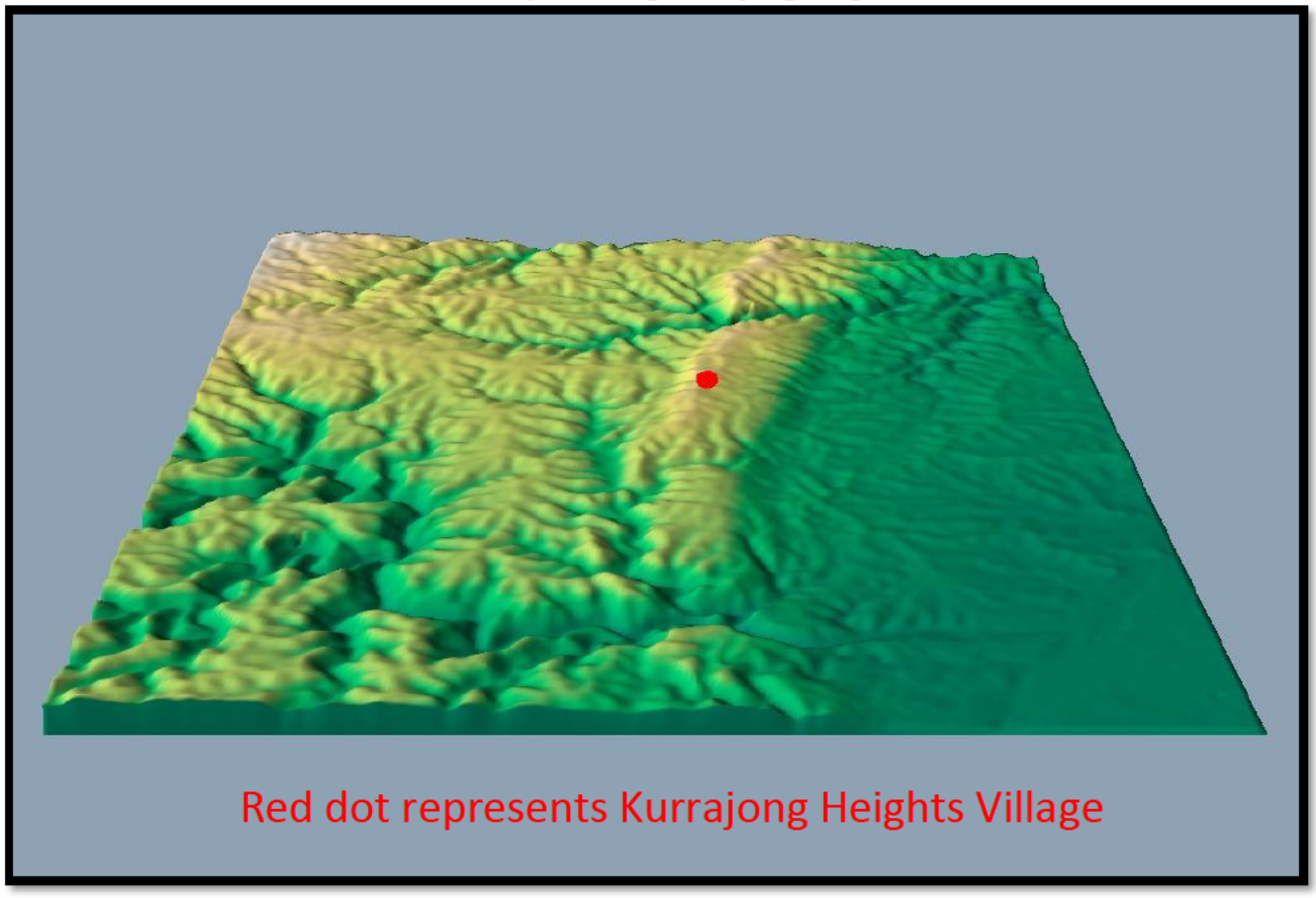
KURRAJONG HEIGHTS BUSHFIRE MANAGEMENT PLAN (BFMP)

The Kurrajong Heights BFMP was developed and implemented at the local level, utilising extensive local knowledge of terrain, fire behaviour and fire paths.
The plan must be developed by the locals without any bureaucratic influence to be successful. Bureaucratic influence takes away local control and marginalises the community.

Background

Kurrajong Heights (along with the adjoining suburb Bowen Mountain) is regarded as the greatest bushfire risk in the Hawkesbury Area.
Kurrajong Heights sits on top of a mountain range completely surrounded by bush.
Sitting on top of a mountain range means that no matter which direction fire comes from, it has a rapid run uphill into the Heights.
The red dot on the 3D map shows the location of our village and our vulnerability.

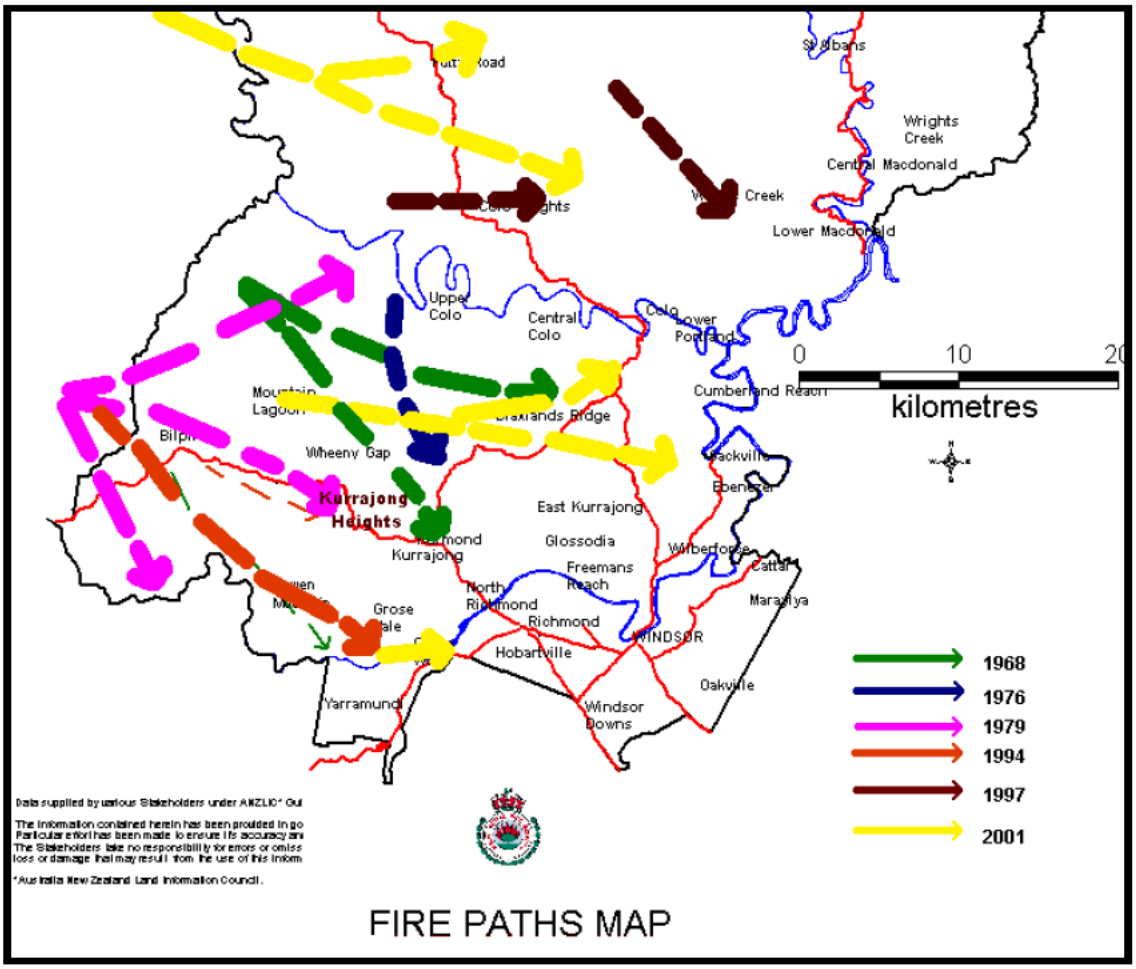
3D Map showing Kurrajong Heights



Kurrajong Heights sits between the Blue Mountains National Park and the Wollemi National Park. With these parks comprising nearly three quarters of a million hectares.

Fire History

History shows a regular pattern of wildfire originating from the National Parks to our west and northwest.



The map clearly shows the frequency to which Kurrajong Heights is subject to wildfire events.

Hazard Reduction by Prescribed Burning

The brigade does the hazard reduction burns according to a prescription.
The aim of the burn is to burn fine ground fuels with a flame height of no more than one metre.
We burn with enough moisture in the fuel to leave the humus layer unburnt. As it's the humus layer that protects from erosion.
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 retreat areas.
The low flame height , low intensity and slow progression means that animals can safely retreat.

This is in stark comparison to a wildfire that is hot, fast moving and destroys everything.
Areas are never the same, with biodiversity changed for a lifetime.
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 run off also causes enormous problems for water catchments.

The aim of the prescribed burning is to reduce the amount of fine fuels to a level that will not support a crown fire.

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

Image: Gospers Mountain Fire approaching Kurrajong Heights on the catastrophic fire day, 21st December 2019.

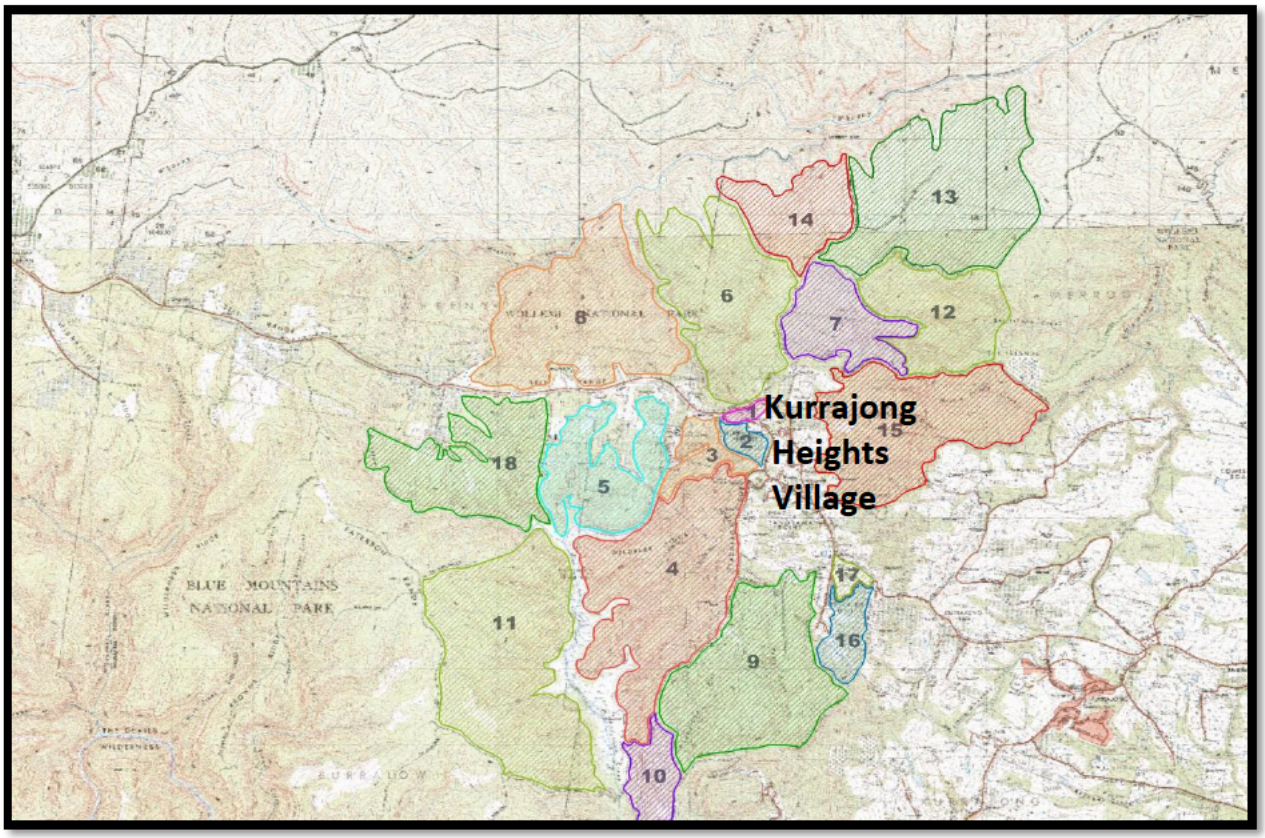
On the 21st December 2019, the Gospers Mountain Fire devastated Bilpin destroying homes. Bilpin is the suburb immediately to our west.

On the 22nd and 23rd December 2019 a 20km backburn was put in at Kurrajong Heights from the Bells Line of Road to the Grose River. This stopped the Gospers Mountain Fire impacting on the villages of Kurrajong Heights and Bowen Mountain, protecting more than 1,000 homes.
The only reason this back burn was sucessful and never got away was that we were back burning in fuel reduced areas.

Image: Kurrajong Heights Brigade members conducting the back burn on 22nd December 2019.

Mosaic Burn Pattern

The brigade reduces fuel by the hazard reduction burning of blocks.
Blocks are burn on a rotational basis using a mosaic zoning approach.
The brigade burns the blocks in a mosaic pattern that are 3 blocks deep to protect the village.



Once the mosaic pattern is implemented and maintained, for any given year of extreme fire at least one of the blocks will provide an area where an approaching wildfire can be slowed and treated.

In 2001, the Grahame Creek fire started to the north of Kurrajong Heights. It ran 31km in one day through predominately 15+ year fuel.
When the fire reached our hazard reduced block 6, it slowed dramatically taking 6 days to travel 5kms.
Block 6 was hazard reduced by prescribed burning in 1997 and having only 4 year old fuels meant the fire was easily managed.
The reason it took 6 days to extinguish was the fire was in inaccessible country and we had to wait for it to come out to an area where we could work.

My own Property

I am so convinced that fuel reduction works to reduce the impact of wildfire I use this principle on my own property.
I reduce the amount of fine fuels concentrating on areas around my home and shed.
My home lies to the west of Kurrajong Heights and was impacted on the catastrophic fire day on the 21st December 2019.
My home and large shed remained unscathed despite severe fire impacting my property on 3 sides.
The following images show the fire impacting my home and the last image shows how the wildfire self extinguished within 70 metres of coming into my fuel reduced area.
I still have large green trees in my property, which has provided a safe haven for the many fire affected animals of the Gospers Mountain Fire.

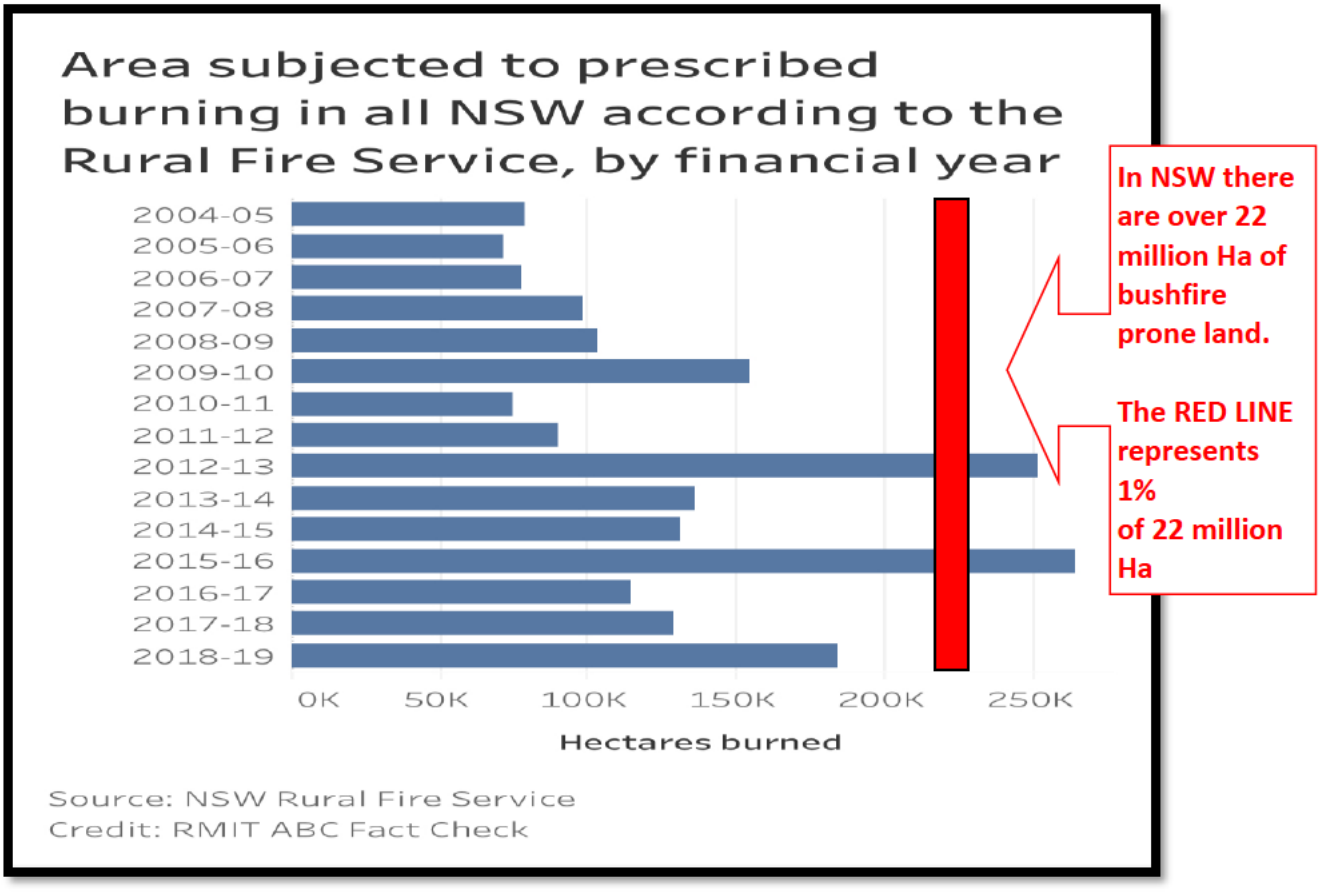
Image taken 27th December 2019 - 6 days after impact

10. Safety of first responders

In my 52 years as a volunteer fire fighter, the 2019-20 bushfire season was the most dangerous conditions I have ever encountered.
Resulting in the death of 6 fire fighters in 3 separate incidents.
And with the death of a further 18 citizens who lost their lives simply trying to protect their homes.

Fire fighting equipment and technology has progressed significantly over the past 52 years, which should mean that we are safer.
Sadly this is not the case. Fire intensities are increasing year on year due to the lack of hazard reduction taking place in NSW.
The Victorian Royal Commission into the 2009 Black Saturday Fire recommended that 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 by prescribed burning.
This percentage difference might not sound like much of a difference, but in practical terms it means that it would take over 100 years to treat our fire prone lands just once.

You may hear evidence that there was more hazard reduction done in the last 12 months than previous years.
But this needs to be seen in context.
The hazard reduced area was still less than 1% of the state's bushfire prone lands.



The fuel load for the 2019-20 bushfire season was at the highest level the state has ever seen.
And when you consider that fire intensity increases exponentially based on fuel loads, it wasn't hard to see that this disaster was going to happen.

The fire weather was no different to fire weathers of the past.
The fire simply had enough fuel to get to a stage where man could not put it out.
And with fuel loads high across the entire state it created the perfect conditions for firestorms to develop, further putting first responders lives at risk.

I have played a significant role in many large fires.
Heavy fuel loads are supporting larger and more intense fires.
We are going beyond the boundaries of safe fire fighting being within these heavy fuel loads. I am becoming increasingly concerned for my safety and for the safety of those under my command.
I worry that fire fighters will die on the fire ground whilst under my command.
A burden that I do not want to carry for the rest of my life.
My vast fire experience is no match for the treacherous fuel loads.

Every government inquiry since the 1939 Stretton Royal Commission has highlighted that the lack of hazard reduction burning was a major contributing factor to the severity of the fires.
It's time we stopped ignoring the overwhelming body of evidence.
It's time we started to take responsibility.

The state government and the RFS recognise these catastrophic fire conditions, advising residents to leave their homes early.
Residents are leaving their homes at the same time volunteers are being sent in.
Yes, fire fighters have training, equipment and expertise, but once over run with an intense wall of flame - we are no more invincible than anyone else.

Successive governments have been given the wrong advice.
There was a belief that if there was a large enough fire fighting force, fires could be put out.
A fire that is over 4,000kW/m2 cannot be extinguished - no matter how many fire fighters, tankers or aircraft are employed.
These fires prove that this experiment has been a disastrous failure.

Brian Williams Profile

- Volunteer Fire Fighter - 52 years
- Captain Kurrajong Heights RFB - 35 years
- Team Leader Hawkesbury RAFT (Remote Area Fire fighting Team) - 11 years
- Group Leader Qualified
- Incident Controller
- Divisional Commander
- Prescribed Burn Supervisor
- Safety Officer
- Member National Fire Experts Group
- Panel Member Independent Hazard Reduction Audit Panel (State Government Panel)
- Called to give evidence at 6 x Government Inquiries
- Called to give evidence at 1 x Coronial Inquiry