

Royal Commission into National Natural Disaster Arrangements

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.

I welcome this Royal Commission and the opportunity to be part of the solution. To explain to the Commission fundamental fire science and a proven effective bushfire strategy - so no Australian has to endure this level of death, destruction and suffering again.

We must proactively prevent wildfires, because they are preventable. My following submission will show how.

Kurrajong Heights (along with the adjoining suburb Bowen Mountain) is regarded as the greatest bushfire risk in the Hawkesbury Area of NSW. 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 happily coexist if area appropriate Bush Fire Management Plans (BFMP) are developed and 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 2019. A day that the RFS predicted Kurrajong Heights would be completely over run.

Our community and the environment (including our beloved koala colony) were protected. And the principles of our proven successful strategy can easily be rolled out across the nation.

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: diane.brianwilliams@bigpond.com

Phone: (02) 45670216

(f) (i) Land management , including hazard reduction measures.

The duration, spread and intensity of the 2019-2020 fires across Australia has clearly demonstrated that current land management practices and strategies are not working.

In one "Black Summer" we witnessed the incineration of 18 million hectares, the death of 34 people, the loss of 2,779 homes and the loss of an estimated 1 billion animals.

These figures are easy to gloss over, but to those who fought the fires, those who lived in fear as fire approached, those who witnessed animals die and suffer, those who lost homes, those who had their friends and family killed - their lives will never be the same again.

It is unforgivable to think that this level of death, destruction and suffering was allowed to take place.

We have held 18 major inquiries into bushfires since 1939 and have not heeded the lessons learnt.

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.

In the Nation Charred Inquiry 2003 "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 Royal Commission 2009 went further recommending a minimum figure for hazard reduction. They recommended that a minimum of 5% of all fire prone lands be treated annually.

We have not hazard reduced enough of the nation's fire prone lands and are now paying a devastating price.

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.

Allowing fuel loads to build to this level is a negligent way to manage our environment and protect our people.

When the best NSW can offer their citizens is to "leave their homes early", something has gone spectacularly wrong with land management practices.

The Kurrajong Heights Rural Fire Brigade has developed and implemented a land management plan that is highly successful and kept our community safe and our environment pristine for the past 68 years.

The success of our land management plan or bushfire management plan (BFMP) means 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.

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

Before I discuss the Kurrajong Heights BFMP I need to discuss bushfire fundamentals - the fire triangle and the 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.

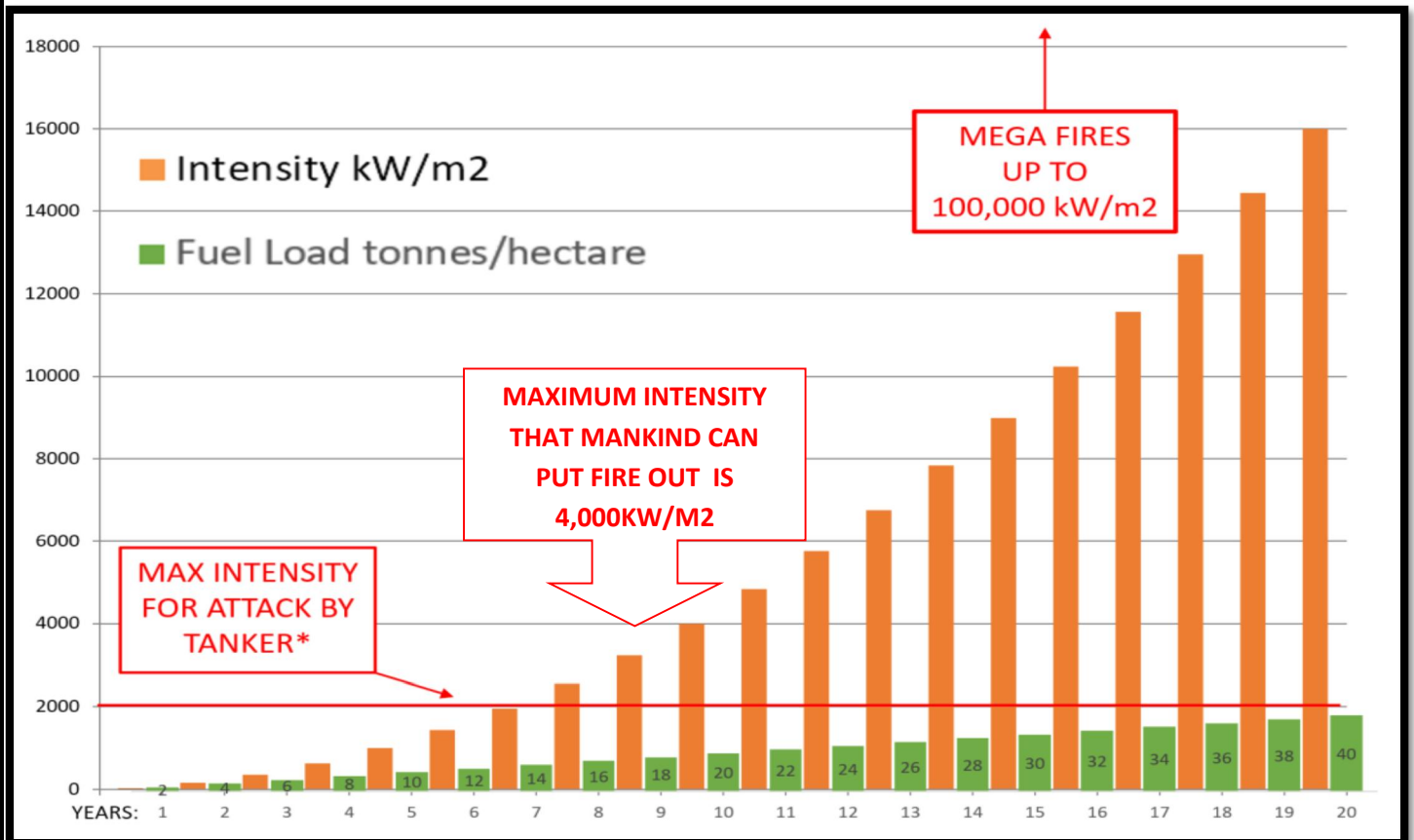
Large fires will be sustained if there is enough fuel - even in low temperatures.

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>

MAXIMUM INTENSITY THAT MANKIND CAN PUT FIRE OUT 4,000 KW/M2

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 from the south to north on 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.



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

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

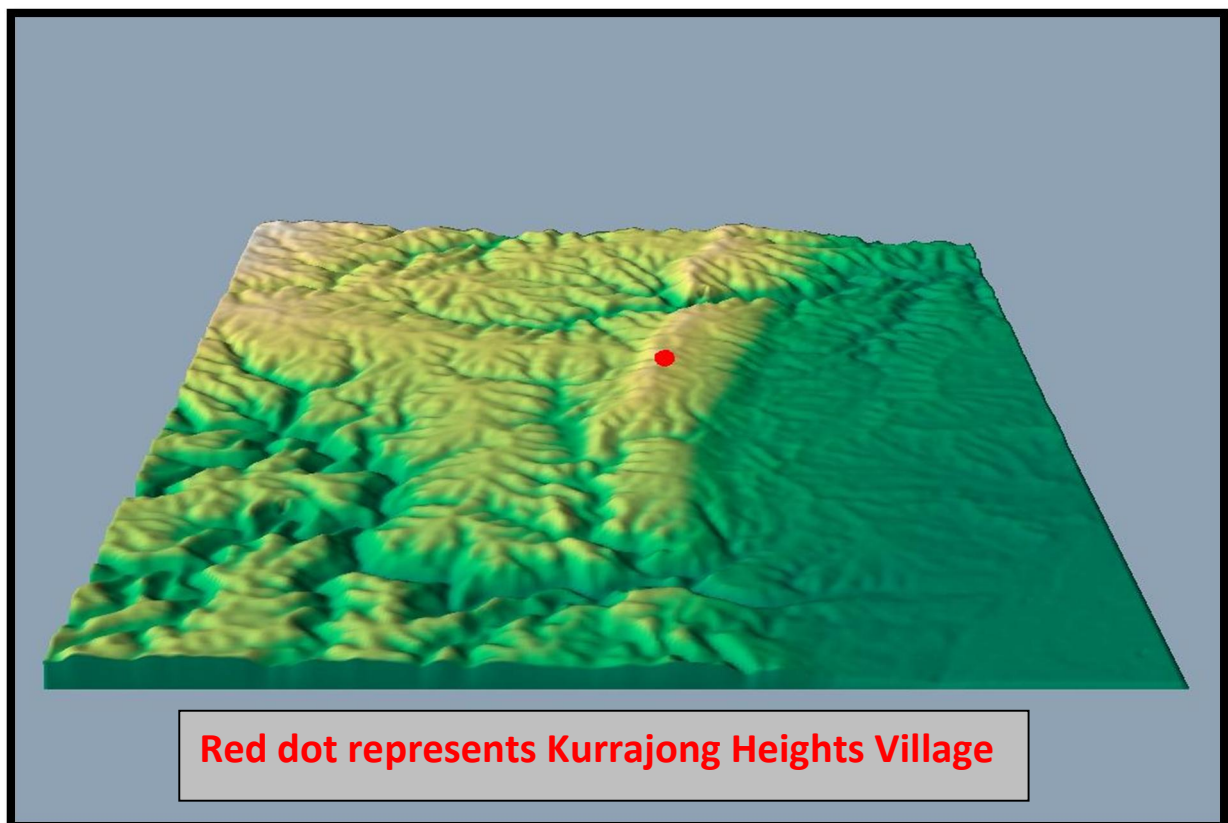
Kurrajong Heights (along with the adjoining suburb Bowen Mountain) is regarded as the greatest bushfire risk in the Hawkesbury Area.

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.

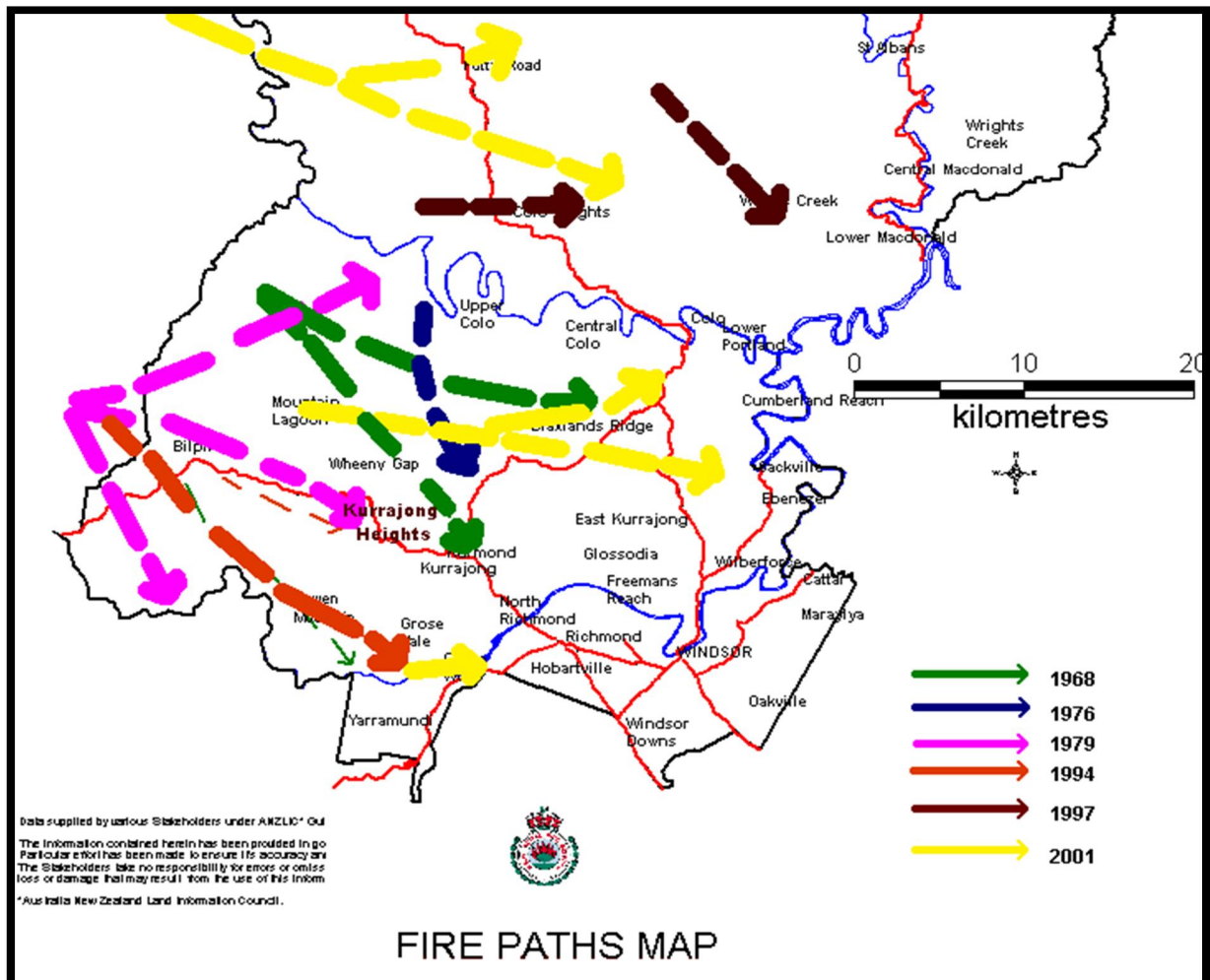
3D Map showing Kurrajong Heights



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.

Kurrajong Heights simultaneously had fire to the North, West and South of us on that day.

On the 22nd and 23rd December 2019 a 20km back burn was put in at Kurrajong Heights south 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 successful and never got away was that we were back burning in fuel reduced areas.



**Images: Back burning at Kurrajong Heights on 22nd December 2019
to stop the progress of the Eastern edge of the Gospers Mountain Fire**

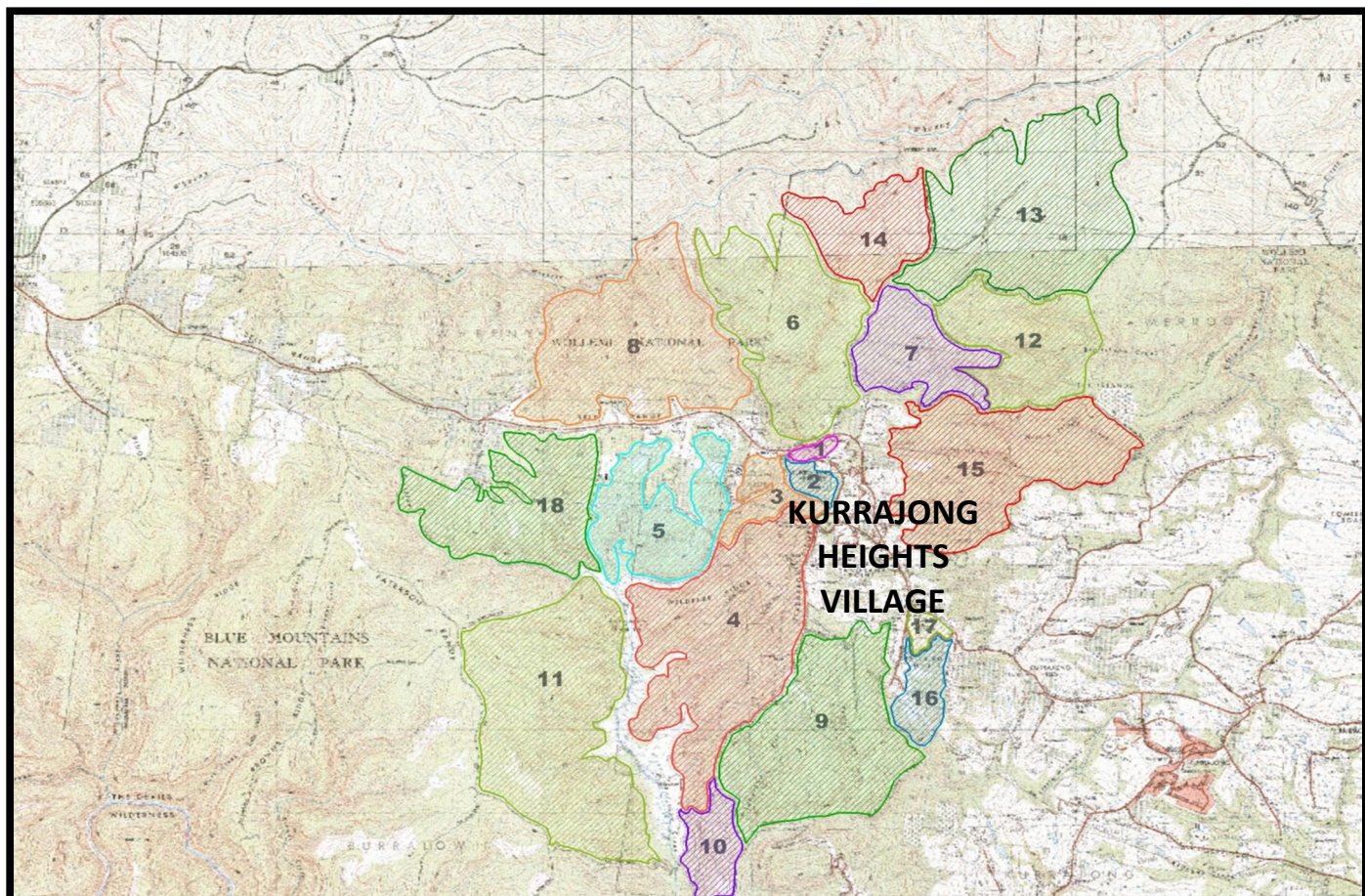


Mosaic Burn Pattern

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 regular fuel reduction enhances biodiversity and 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: Gospers Mountain Fire approaching my property - 21st December 2019



Image taken 21st December 2019



Image taken 27th December 2019 - 6 days after impact

(f) (ii) Wildlife management and species conservation, including biodiversity, habitat protection and restoration

The Kurrajong Heights Rural Fire Brigade has developed and implemented a land management plan that has protected both our community and our pristine environment for the past 68 years. And all this is despite living in an extreme fire danger area. Our plan was comprehensively outlined in the previous section and can be reviewed there.

The success of the plan means we enjoy excellent flora and fauna biodiversity. We have a tall timber 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.

This in comparison to the National Park approximately 15 km to our west, between Mt Tomah and Bell. 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.

The Kurrajong Heights plan 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.

Unfortunately we are finding that bureaucracy is creeping into all aspects of our plan. The 'Red' and 'green' tape are preventing proven successful land management practices being 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 - Stone Terrace hazard reduction

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 2 previous RFS assessments were 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.

In the Nation Charred Inquiry 2003," the Committee heard a consistent message right around Australia:- there has been grossly inadequate hazard reduction burning on public lands for far too long".

And the brigade agrees.

Bureaucracy, red tape and green tape is hamstringing the process, causing untold environmental damage.

Over the past 20 years, NSW has on average treated less than 1% of its fire prone lands by hazard reduction annually.

This means that if we continue at this rate, it will take 100 years to treat our fire prone lands just once.

This is in stark contrast to the Victorian Royal Commission which recommends that a minimum of 5% of fire prone lands be treated annually. Which means that all fire prone lands would be treated once every 20 years.

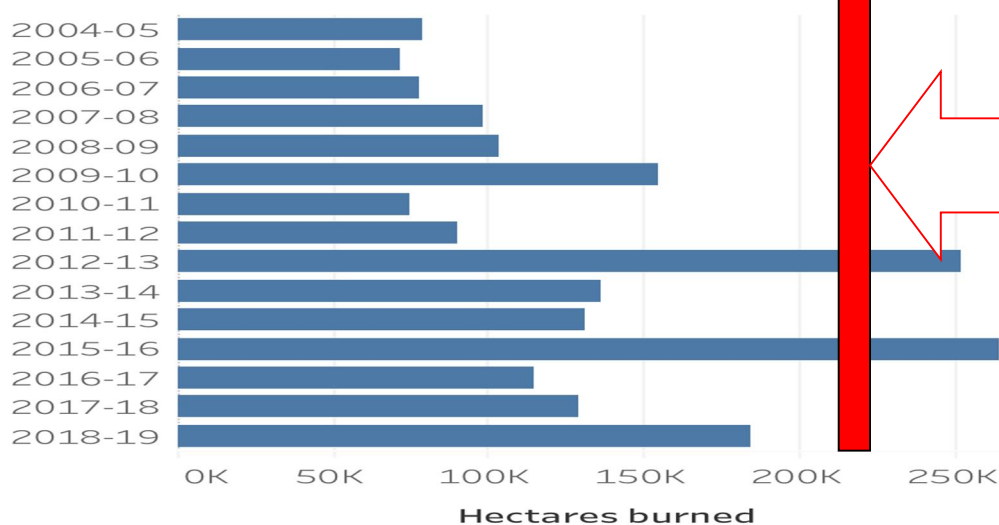
20 years is still inadequate, but far superior to 100 years.

The graph using figures supplied by the RFS demonstrates that amount of hectares being hazard reduced.

NSW has over 22 million of hectares of bushfire prone land, so 1% = 220,000 hectares.

The vertical red line at 220,000 hectares demonstrates that we average much less than the 1%, let alone the 5% recommended by the Victorian Royal Commission.

Area subjected to prescribed burning in all NSW according to the Rural Fire Service, by financial year



In NSW there are over 22 million hectares of bushfire prone land.

The RED LINE represents 1%. 220, 000 hectares.

Source: NSW Rural Fire Service
Credit: RMIT ABC Fact Check

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 our environment, our wildlife and our biodiversity at risk.

It is unthinkable that we are managing our bushland by incineration.

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.

Regardless of any influence by climate change, major wildfires are still preventable.

With the current conditions being hotter and drier, the window of opportunity for hazard reduction has increased, not decreased.

Hazard reductions can now be implemented throughout the winter months, when once that was difficult.

It is the bureaucracy, red tape and green tape that makes hazard reduction difficult, not the climate.

Having a centralized bureaucracy overseeing the entire state has clearly not worked.

There are 2,002 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 each of the 2,002 brigades look after their own area simplifies a huge problem.

Burning on a 7 year timeframe, each brigade would only need to accomplish 1,570 hectares per year.

This would become even easier if the NPWS looked after hazard reduction on their own land.

Volunteers make up over 98% of the service, they need to develop and implement fire mitigation practices that directly affect them.

Nobody cares more about their environment than those that actually live in it.

In the Nation Charred Inquiry 2003, page 51 "The CSIRO stated that the cheapest and most ecologically sound way to [manage fuel] is by prescribed burning".

I couldn't agree more.

Brian Williams Profile

- Volunteer Fire Fighter - 52 years
- Captain Kurrajong Heights RFB - 35 years - ongoing
- 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

