Sub 158

A Submission on Behalf of Kurrajong Heights Rural Fire Brigade

Captain

Brian Williams
2175 Bells Line of Road
Kurrajong Heights 2758
4567 7184

Senior Deputy Captain

Ray Lewis
34 Bellbird Ave
Kurrajong Heights 2758
4567 7147

The Committee Manager
Select Committee on
Bushfires
Parliament House
Canberra ACT 2600

In response to your invitation, I have pleasure in forwarding a submission on behalf of the Kurrajong Heights Rural Fire Brigade.

Comments have been selective, targeting only some, or parts of, the advertised terms of reference.

Some of the strategies advocated will not find universal acceptance but they have been used here with success, despite opposition. The Brigade has developed a plan for the management of fire at Kurrajong Heights, which, with Bowen Mountain, is regarded as the greatest risk in the Hawkesbury City area. Our plan has worked - both villages with a total of approx. 900 homes are intact. The fire impacted in part on the village area of Kurrajong Heights, then it was slowed and then stopped in the hazard reduced areas. These hazard reductions gave sufficient time for back burning operations to take place to protect the village areas of Kurrajong Heights and Bowen Mountain. People and bushland can coexist.

Our protection strategy relies heavily on local knowledge of terrain, fire behaviour and fire paths. The two senior officers of the Brigade – the Captain, Brian Williams & the Senior Deputy Captain, Ray Lewis have had over 60 years experience collectively between them. Brian and Ray have indicated they would welcome the opportunity to address the inquiry.

Your Committee is cordially invited to examine our program using the maps provided or preferably by inspection at first hand. We would be pleased to host such a visit.

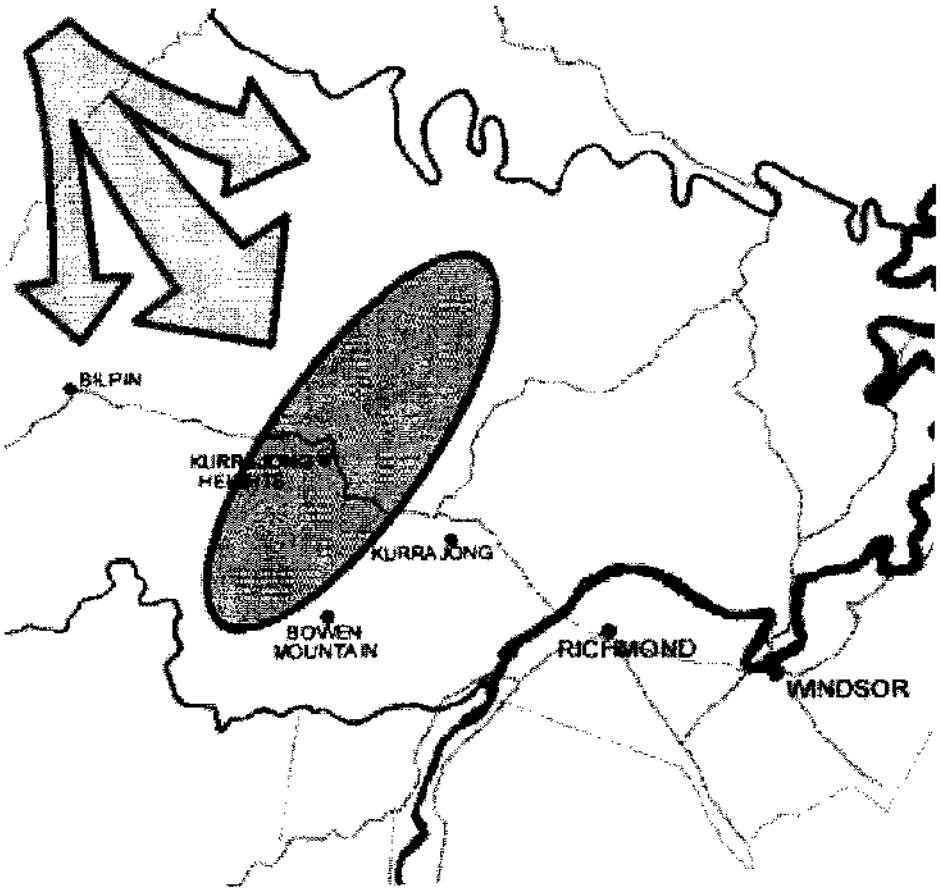
Yours faithfully

Darryl Smith
President

A Case for Hazard Reduction and Other Fire Prevention Measures

1. Introduction – Kurrajong Heights Region – Risk

- Kurrajong Heights along with Bowen Mountain is regarded as the greatest Bushfire risk in the Hawkesbury City Area. The area sits on top of a mountain area surrounded by Sclerophyll forest. The steep largely inaccessible terrain results in a dramatic increase in intensity and rate of spread of wild fire.
- Regions immediately to the south west, west and north west are the heavily wooded Blue Mountains National Park and the Wollemi National Park with large build ups of forest debris. Much of this area is now World Heritage listed.
- Often severe summer weather conditions with strong W/NW winds accompanied by low humidity result in extreme fire alerts.
- Severe regional electrical storms provide natural ignition.
- In latter times we face an increasing rate of fire due to human cause whether by tragic accident or sadly by arson.
- Over 100 years of history shows a regular pattern of extremely intense wildfire originating to the immediate west and north west. Major emergencies are recorded for 1937, 1944, 1957, 1961, 1968, 1974, 1976, 1977, 1979, 1981, 1990, 1994, and 1997 and 2001/2002. All follow a similar pattern and direction, some have been stopped or turned, some have broken through and caused destruction to houses and property through to Richmond and beyond. Sadly some of these fires have resulted in tragic loss of life.



- **The Kurrajong Heights Brigade was established 50 years ago and in that period have an enviable record of having no losses a life or houses.**

- Over the last 25 years a **Strategy of a Zoned Approach to Hazard Reduction** has been developed. This plan has evolved from the accumulated experiences of local farmers and residents and from observations of fire behaviour in the local region.

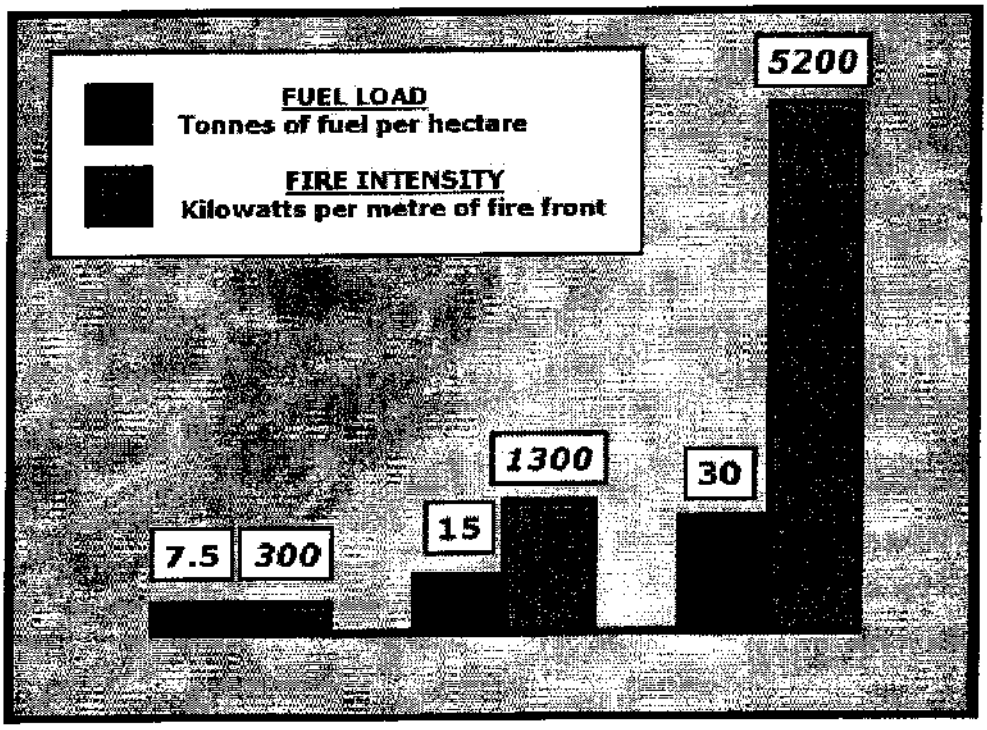
- In the Xmas to New Year Period December 2001- Jan 2002 a major emergency erupted in the Wollemi National Park at Graham's Creek and threatened our communities. It is the belief of the members of our Brigade the long term hazard reduction strategies that were in place helped in the ultimate successful containment of this threat – without the loss of life and without the loss of homes within the Kurrajong Heights area of operations.

This submission outlines the example of the effective use of the Zoning Approach to Hazard Reduction. This approach has been acknowledged by the recent NSW Inquiry into the 2001/2002 Bushfires.

2. The Impact of Wildfire

- Major Intensity wild fires destroy **<u>everything – All flora and All fauna – EVERYTHING in their path.</u>** It burns the soil, it explodes rocks and it creates conditions for an enormous loss of topsoil and humus due to erosion and with it the resultant loss of nutrients. The silt run off after rain finds its way into all the gullies creeks and rivers, adding to the environmental damage. After wildfire a thunderstorm can remove 2000 years worth of topsoil buildup. **The Australian landscape cannot sustain this loss of valuable topsoil, humus and nutrients.**
- It is our experience that areas that have been repeatedly subject to wild fire showed dramatic loss in bio-diversity of flora and fauna.
- WILDFIRE – high intensity fires with energy levels 5000 to 100,000 kilowatts per meter of fire front – the devastation potential rivals that of a nuclear blast.
  <u>These fires cannot be put out by man</u> – the only way these fires are extinguished is by rain or by removal of the fuel.
  Conditions for wildfire are established where the ground fuel such as bush litter is allowed to build up to high levels. The graphic below shows the fire intensity as a result of various fuel levels of forest litter.

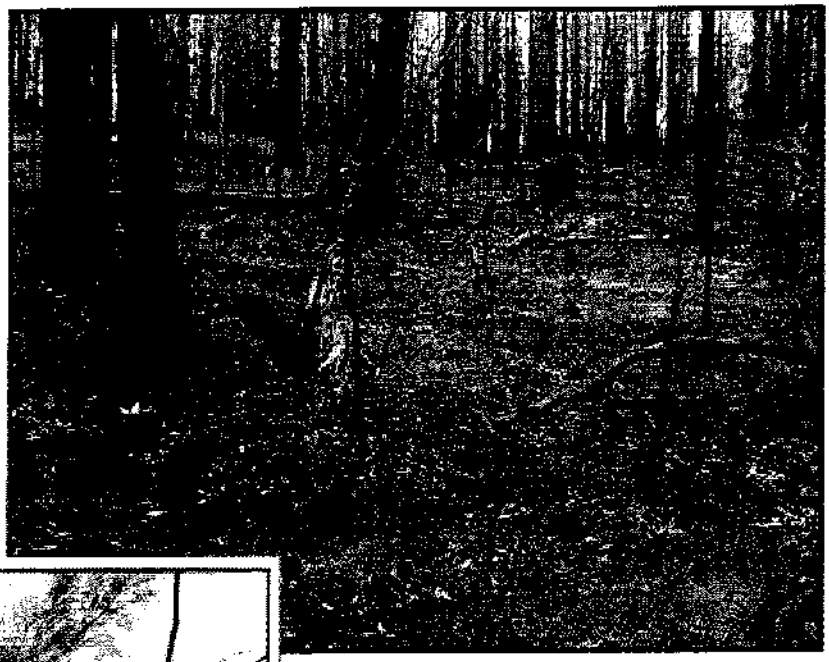
Fires run on Fuel



Fuel builds up in the Australian bush at an average of two tonnes per hectare per year.

7.5 tonnes per hectare is very easily managed as it only produces 300 kWh per metre.
Increase the fuel load by 4 to 30 tonnes per hectare and fire intensity is increased by over 17 times to an uncontrollable wild fire. (figures supplied by Rural Fire Service of NSW).

Examples of the devastation caused by wild fire in the recent fire surrounding Kurrajong Heights and Bowen Mountain are shown in the following images.



3. Hazard Reduction and Other Fire Prevention Measures

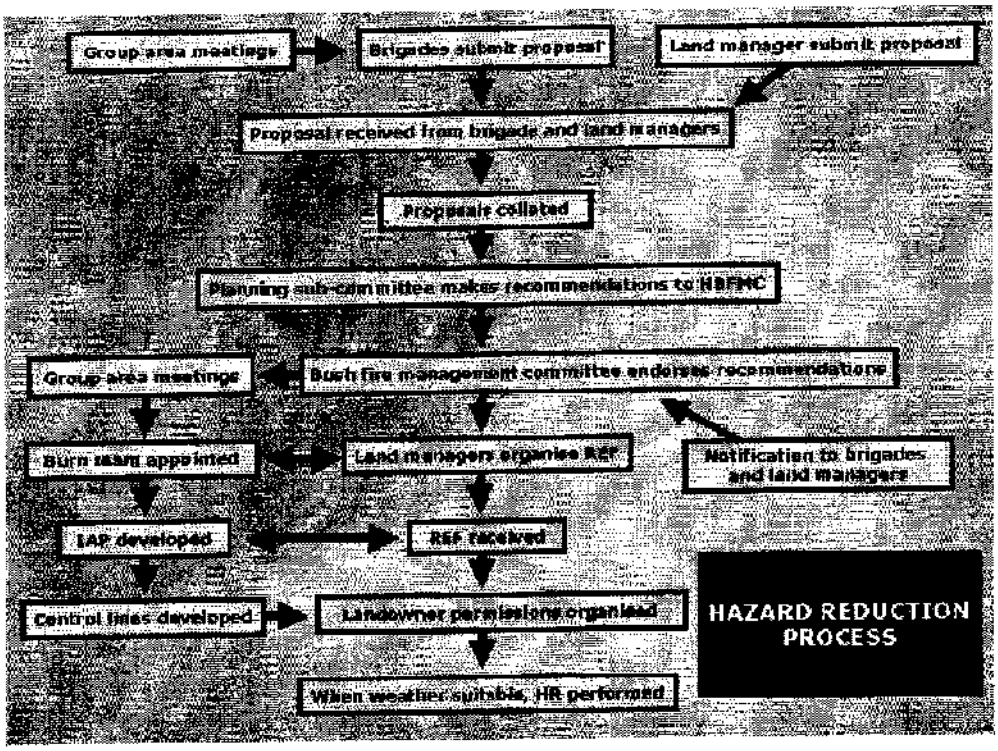
The burning/fuel reduction of bushland in all areas is the only positive way of reducing the impact of wild fires. It has long been recognised the only factor influencing the behaviour and spread of wildfire that can be modified by man is the fuel available for combustion – **reduce the fuel** and therefore **reduce the impact of wildfire.**

The aim of a Hazard Reduction is to remove the accumulated bush litter and not affect soil humus or large vegetation and retain the canopy cover of the forest. It is usually carried out in the cooler months under conditions that are conducive to slow controlled burning and to minimise impact on the environment. Under a controlled hazard reduction it is aimed to reduce material up to 6mm in diameter only *(see graphic of bush litter).*

This is the material to be removed by Hazard Reduction
(Source - The Burning Question – Dept of Bush Fire Services)

Hazard Reduction is the major and an ongoing defence Strategy. It is a simple, cost effective and environmentally friendly method of alleviating the fire threat. It is imperative that the planning and implementation is kept at the local level and should not be encumbered by bureaucratic processes.

A proposal for a strategy can take up to 6 years to get through the Bureaucracy (as has been the experience of our brigade). The approval procedures are expensive to implement - see following graphic of the required R.E.F. (Review of Environmental Factors) procedure.



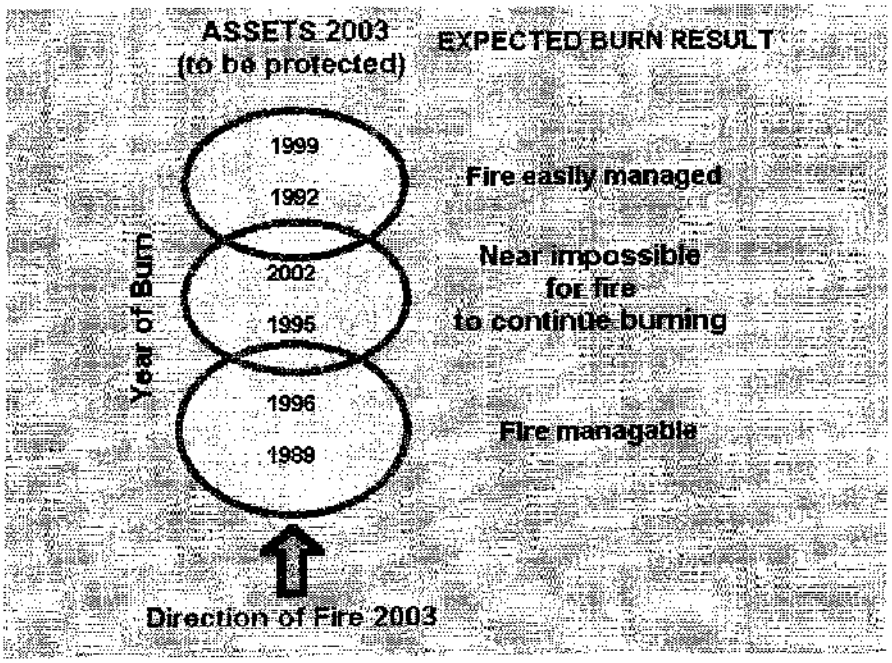
Once in place further bureaucratic processes should not encumber the plan. It should be delegated to the local level to implement. Hazard reduction can take many days to complete and **the window of opportunity in the weather conditions may not allow for an extended approval process.** For example, the recent September 2001 operation at Burralow Rd took at least 7 days to complete and this proved to be our saviour in the recent 2001/2002 emergency.

4. The Zoning Approach to Hazard Reduction

Examples are put forward that the bush needs constant burning to keep fuel load low and to stop wildfire. This procedure does tremendous damage to the bush.

As an alternative strategy Kurrajong Heights Brigade has implemented a strategy of Hazard Reduction using a Mosaic Zoning pattern. This process allows the time between protection burns to be lengthened with resulting benefits to the environment. This method still keeps a low fuel area as a blocking influence across the approach of wild fire.

This method is shown in schematic form in the following diagram.



In the above example the zone pattern is three plots deep and cycle of hazard reduction burns is 7-8years. Once such zoned mosaic is put in place and maintained, for any given year of extreme fire at least one of the zones will provide a "block" to the approaching wildfire.

From our experience the zone approach produces a superior environmental outcome.

A more detailed description of the implemented hazard reduction plan (as Kurrajong Heights Brigade has applied) is as follows:

<u>Plan For the Protection of Villages and Built up areas</u>

The control burning of large established areas eg 500 – 1000 hectares set out in a mosaic interlocking pattern to cover known fire prone areas:

a) To establish a defence in depth having a different fuel loading (time between burns) in each interlocking and covering area.
b) To establish a track/trail network to access areas for the formation of hazard reduction blocks. These tracks/trails are to be permanent and suitable for the movement of heavy vehicles and personnel safely and quickly.

The areas of hazard reduction should be planned and mapped in all Brigade areas throughout NSW by the individual brigades in their operational areas using local knowledge.

These hazard reduction areas (blocks), once established, can then be used to great advantage in the suppression of wild fire.

These areas could then be called suppression blocks, as once used for hazard reduction they allow you to pre know all of the following to help in suppressing a wild fire:

1. Area fuel loading known
2. Area is pre-mapped
3. Area adjoining fire area fuel loading known
4. Tracks/trails pre-established:
    a) Damage to bushland is reduced – (no new tracks are pushed in.)
    b) No cost in regeneraring new tracks
    c) The use of bulldozers in an emergency to establish new tracks is very costly and also delays the implementation of fire suppression operations)
5. Burn directions known
6. Stop/start points of burn known
7. Types of vehicle required suiting tracks and conditions pre known.
8. Water points dams/tanks locations known
9. Provide Helicopter landing sites and dams for water bombing
10. Buoy wall positioning sites known *(a buoy wall is a portable water bag/ dam containing upwards of 10,000 litres)*
11. Provide suitable command and marshalling areas
12. Can use H/R blocks for steering fire to areas more suitable for suppression.

The inner hazard reduction blocks established for the protection of villages and built up areas may be burnt at frequencies outside ideal timing for all flora and fauna so as to keep fuel loadings down.

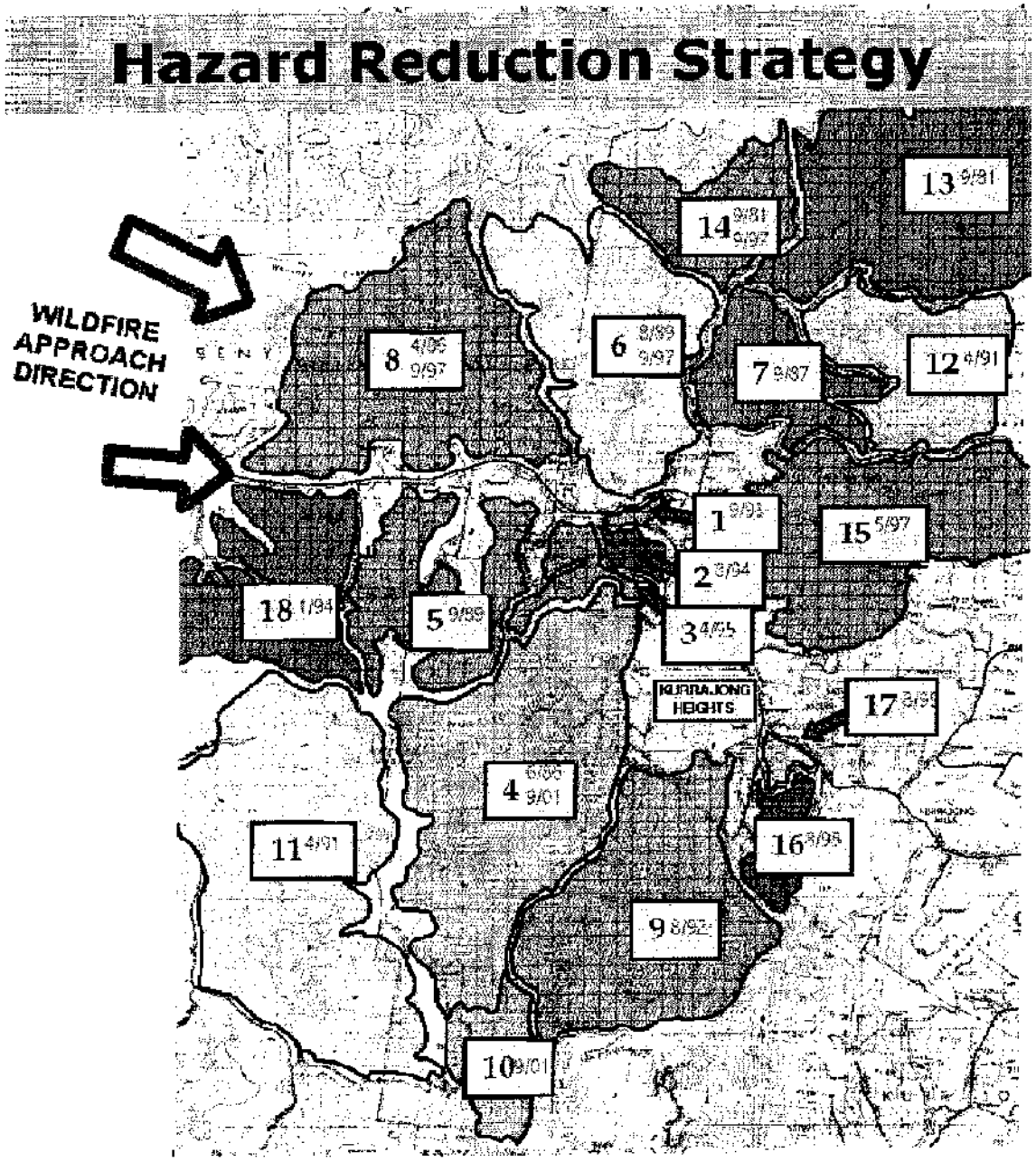
Ideally, once these blocks have been gazetted they should be fuel reduced on a rotational program without the delays and costs of Review of Environmental Factors (R.E.F.) requirements. THIS IS NOT THE CASE TODAY – IT IS TAKING UP TO 6 YEARS TO GET SUBMISSIONS PAST THE BUREAUCRACY.

Outside the Hazard Reduction blocks established for the protection of villages and built up areas, that is the greater bushland areas, a mosaic pattern of very large areas should be fuel reduced on a rotational basis to suit the requirements of R.E.F. management.

Hazard reduction may or may not stop a wild fire as the result depends on the timing between the hazard reduction and the wildfire impact. However, it will almost certainly mitigate the effects of the wild fire and can gain valuable time for fire fighters and above all allow much safer conditions to combat the fire. In addition, the use of aircraft for water bombing has a much greater effect on low fuel loads as affected by hazard reduction strategies.

It is also considered main roads should be used for major control lines – properties and bushland to be fuel reduced to at least 500m both sides of the roadway.

The Kurrajong Heights Brigade has in place a systematic mosaic pattern of hazard reduction (*see below*) of its Brigade's area of responsibility.



Because of this strategy, Kurrajong Heights has, we believe, an excellent Flora and Fauna bio-diversity with tall timber and tree canopy and low open scrub growth. The tall canopy helps retain soil moisture year round, aiding humus formation and soil improvement. In addition, the slow moderate hazard reduction burns protects the fauna habitat by:

- **Leaving gullies unburnt as retreat areas**
- **Minimising the destruction of habitat – hollow logs, rock crevices and humus are retained and this infrastructure can be readily recolonised.**

4. An Example of Effective Use of the Zoning Approach to Hazard Reduction

The recent 2001/2002 Xmas – New Year Emergency clearly demonstrates the effectiveness of the defence strategy. The Rural Fire Service staged a battle over 17 days.

WITHOUT THE YEARS OF PLANNING IN ESTABLISHING THE DEFENCE LINES THE RESULT COULD HAVE BEEN DISASTROUS – WITH A LIKELY MAJOR LOSS OF PROPERTY & POSSIBLY LIFE

- Over 110 thousand hectares were devastated by wild fire

(Source – Rural Fire Service)

Attached (Appendix 1) is a map of the Kurrajong Heights area, showing the hazard reduction blocks and the wildfire of 2001/2002. Also shown is the wildfire of January 1994. The double crossed hatch area shows where the 2001/2002 fires burnt over ground affected by the 1994 fires. The yellow highlighted figures show dates at which the relevant area was last burnt prior to this last fire event.

What we wish to explain, using this map, is an understanding of the positioning of hazard reductions and the wildfire movements.

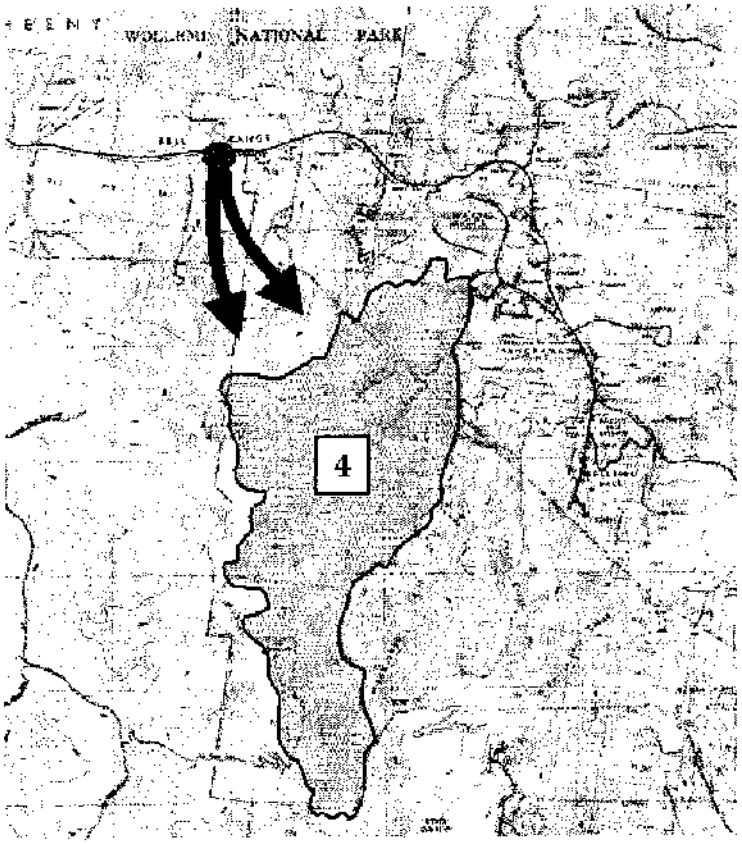
- The fire originated at POINT 1 (green) and moved as the arrows in green show.
- The fire moved to the east very rapidly with the prevailing severe conditions and spread out to the south east and south.

The fire spread and movement to the south towards Kurrajong Heights was slowed by a number of factors:

1. The easing of the severe weather conditions
2. Direct attack on the fire by ground crews
3. Extensive water bombing by aircraft *(first time "Elvis" was used in NSW).*

4. Low fuel areas – A large portion of this area had been hazard reduced in 1997 and this, coupled with factors 1,2,3, bought us time. This time, up to 6 days, enabled us to put in extensive back burning operations to hold the south east and southern flanks on the eastern escarpment and ridgeline running directly into the villages of Kurrajong Heights and Kurrajong.

After these operations had taken place successfully, the fire still had to be contained to the north western side of Kurrajong Heights. To effect this containment another large back burning operation took place, but unfortunately, the weather conditions on the day after the back burn deteriorated into a very severe fire weather day, with blow up conditions. Spotting took place from the main fire into a large pine plantation (red dot in figure below) and this was rapidly engulfed in fire. The result of this was a large number of spot fires starting to the south of Bells line of Road. From this spotting a very large and severe fire developed and this fire moved rapidly to the south east and with enormous energy.



The fire literally crashed into a large hazard reduction that had been put into place in September 2001 (see appendix 1 – black arrows and figure above -HR area in pink). The forward progress to the south east was completely stopped, *"its legs – if you like, were chopped off"*. Then of course, the fire being what it is, sought a way through.

There were areas of unburnt ground from the hazard reduction of September 2001, in gullies that are normally too damp to ignite during hazard reduction operations. The fire found and moved along them, uphill to the eastern side of the hazard reduction in about 4 locations (see map – highlighted in red). The fire width of these runs varied between 5 metres and 50 metres when impacting on the eastern back of the hazard reduced area. The time of these runs varied

from 10 hours for the first one to 48 hours for the last from the time of wildfire impact, making these penetrations easily contained.

The fire then moved south along the western flank of the hazard reduction and to the south west, where it was stopped by containment lines and back burning operations.

- **The rapid progress of this fire to the south east being stopped by this hazard reduction saved what could have been a disaster of MAJOR PROPORTIONS.**

- **On Christmas day the fires to the south had reached the coast in 6 hours. Similarly the weather conditions were extreme and this fire had the same potential, but with more densely populated regions directly in its path.**

IF THIS FIRE HAD NOT BEEN STOPPED, THE VILLAGES OF KURRAJONG HEIGHTS - BOWEN MOUNTAIN - KURRAJONG - GROSE VALE - NORTH RICHMOND - RICHMOND AND REGIONS. THE POTENTIAL WAS THERE FOR A DISASTER OF MASSIVE PROPORTIONS WITH A LARGE LOSS OF PROPERTY.

With these illustrations, the Brigade of Kurrajong Heights is saying again that the only factor influencing the behaviour and spread of wildfire that can be modified by man is the fuel available for combustion.

Without "THE HAZARD REDUCTIONS", there is nothing but disaster for life and property and for the very bush itself.

5. Factors Contributing to the Impact and Severity of Bushfires.

Maintenance of Tracks and Trails

For many years a major concern to all land managers is the security, maintenance of the tracks and trail networks on their respective lands. They recognise the need to have these tracks and trails but are reluctant to keep the existing tracks and trails or establish new ones because of the constant cost of upkeep due to unwarranted use. Also the tracks and trail network can be a security problem. But to address this dilemma, could it not be considered to establish the entrances to these tracks and trails through private land. To take it a step further public land could be put aside to be sold. This area would be small and not impact on the intended use of such land greatly, but would add to the security enormously. Such monies arising from these sales would be put aside for track and trail maintenance.

In Hawkesbury City area, in the 2001 Christmas Fire Emergency, over $300,000 was spent on bulldozers to establish tracks.

Changes between the Rural Fires Act 1949 and 1997

Under the 1949 act residents were allowed to remove small piles of refuse by fire between the hours of 7pm to 7am without seeking approval of the relevant bush fire brigade, during the bush fire season.
After the severe fires of 1994 a waiver of some parts of the Environment Protection Act allowed people to remove by fire, between the hours of 7pm and 7am naturally fallen branches and leaf litter from the adjacent area of the house.
Currently under the 1997 Rural Fires Act and during the Bushfire season, landowners have to obtain a permit 24 hours a day prior to removal by burning. Also, under the Environmental Protection Act they have to obtain permission from Council 24 hours a day for the entire year.

We feel that the restriction or removal of the "free" allowance on landowners adds to their inability to keep their properties clean. This adds greatly to the fire risk, especially if properties are being subjected to ember attack.

6. The roles and Contributions of Volunteers

We are concerned that even though we have far better resources now, our workplace environment is progressively becoming more dangerous due to the enormous amount of fuel buildup.

It is our observation that the members of the RFS seem to becoming a reactive force rather than a fire prevention force. This is resulting in loss of skills in the planning and execution of fire prevention strategies.

The workload being placed on **Volunteers** (due to the massive increase in the number of wildfires and long duration of the campaigns) is putting an intolerable strain on the members, their employers and their livelihood.