Submission No 42

INQUIRY INTO WAMBELONG FIRE

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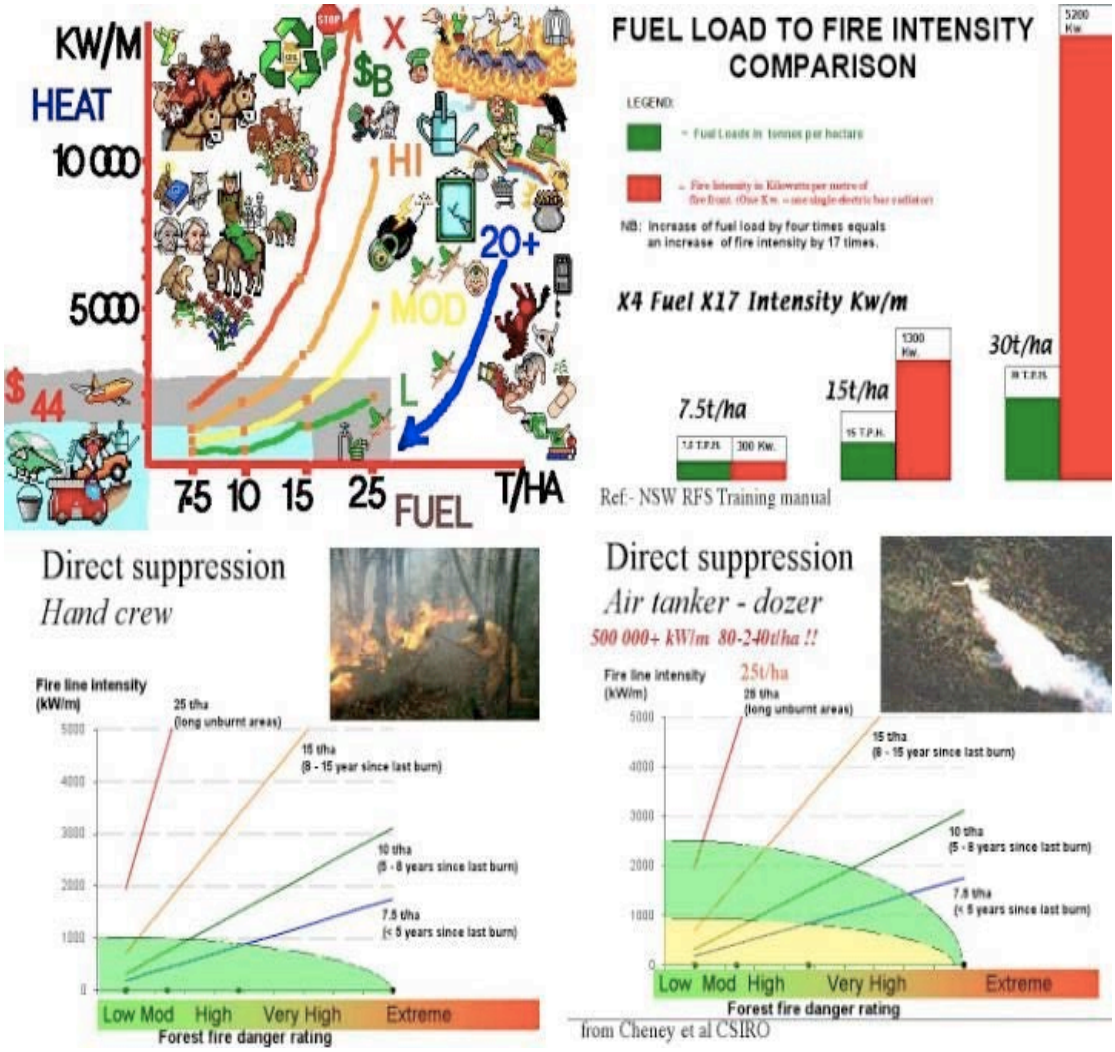

Figure 1 Aerial operations in the Wamblelong Fire 2013 in Extreme Conditions were too dangerous. This is because the fires were putting out, at the very least, the heat of 2, 500 1, 000 Watt radiators per meter of firefront (=2,500 kW/m).

Dear Standing Committee

I went on a short camping trip in the first week of 2013 and decided to camp in a state forest after driving through the Warrumbungle National Park, where I was horrified to see fuel loads high enough to produce a fire so hot it could kill onlookers from 120 metres away in minutes if they were not wearing protective clothing. There was no way I would enjoy a relaxed bush holiday there.

Not long after returning home I was horrified to hear that fires of 1,100° C or more had predictably just consumed most of the park and its animals. I was also horrified but unsurprised to hear that the emergency response drew the usual criticisms that the area's bushfire plan was geared to worsen fires. In that first week of 2013, the park's bush was so dense you could not walk through it. Beneath towering gums were banks of dead branches, blackberries, peeling bark and other scrub. These banks of undergrowth were an extreme fire hazard capable of producing the hottest fire possible and are known as elevated fuel[i]. Below this elevated fuel was a leaf litter layer 3—30cm deep resting above the non-combustible mineral soil. Research shows that leaf litter layers over 5cm deep would have produced firestorms in

extreme conditions in the park's topography, even without the added heat of elevated fuel[ii].

1. The Area's Bushfire Management Plan: There was therefore a high-risk gap between the Bushfire Management Plan and a large body of scientific evidence on how to mitigate bushfires; preserve the environment; protect native species and be a responsible neighbour to people living near the park[iii].

A large body of evidence shows the area's plan was geared to worsen bushfires and that national parks produce NSW's worst firestorms[iv]. The park's plan is based on national park policy that "Mother Nature" is the ideal bushfire manager. Parks personnel generally believe in "Mother Nature" and the suffering this belief causes is extremely concerning. At the upper echelons of policy-making, national parks organize grants for researchers through the Australian Research Council. This research claims to prove "Mother Nature" knows best[v].

Close inspection of this research shows that in fact the evidence disproves the "Mother Nature" research's purported findings, which raises questions of the ethics and funding pressures of research institutions. At best, "Mother Nature" knows best research can be said to lack rigour[vi], attempting to disprove a large body of evidence gathered over the last 74 years that:

- Low fuel loads and rapid response in extreme conditions will break the escalating firestorm cycle.
- Indigenous Australians taught early settlers to hazard reduce to be firestorm free.

National park rangers commonly give the "Mother Nature" knows best argument when explaining their refusal to reduce fuel loads and their prosecution of campers caught burning dead park firewood. The resultant suffering in January 2013 was evidence of far from motherly flaws in the "Mother Nature" argument.

The heat of burning national park fuel loads bent steel and was estimated to be 1,100 deg C or more in areas where fire was most intense. This is hot enough to kill living creatures within minutes at 120 metres or less. Animals caught directly in the fires were vaporised. Trees died at around 1,100 deg C. The resultant charcoal residue fouled watercourses. As the area burnt is so vast, transpiration cycles were broken to create a vast charcoal-crusted rain shadow and drought. Homes and 100s of kilometers of fences were lost, adding further to the misery of having a national park neighbour. Bush people with memories of a fire-managed past found themselves defenceless against the flames.

It was also futile and too dangerous for aircraft water bombing over the fires according to well-tested CSIRO guidelines (see Figure 1). CSIRO research shows that over about 5-8 tonnes per hectare of fuel burning in extreme conditions is so hot water bombing will have no effect and overhead aircraft may crash. As well as this heavily evidenced CSIRO research, CASA air safety legislation makes it unlawful for aerial operations in these conditions. The aircraft were sometimes in mountainous terrain, with visibility poor due to smoke in turbulence and updrafts created by the intense fires. A conservative underestimate of flame intensity equals the heat of 2,500 1,000-Watt radiators per lineal meter of firefront (or 2,500kW/m).

Notwithstanding life-taking breaches of air safety legislation and the futility of these high-risk manoeuvers, helicopters were scooping water and dumping it on fires. Fixed wing aircraft overloaded with water tanks on their wings were taking off to dump water to land again for another load. If the craft were passenger carriers, CASA would criminally prosecute. Only pilots' skills and remarkable reflexes kept

more from dying. Currently water bombing directly over fires wastes expenditure and causes pilot deaths. To be effective current water bombing techniques must:

- Comply with air safety legislation.
- Be capable of dousing flames, and therefore occur when fires are burning at low to moderate intensity.

This requires night flying equipment and night flying credentials because it is at night that fires die down enough for aerial operations to be efficient and effective. This would have prevented a long week of futile water bombing. Even more effective would have been rapid response with water bombing within 30 minutes to an hour after ignition before fires became intense and therefore unstoppable and illegal to attack.

To protect pilot lives, aircraft construction should have complied with Australian air safety legislation and engineering guidelines. Frames should have been strong enough to withstand turbulence and tight manoeuvers - many craft currently on the firegrounds risked losing wings or tails due to inadequate frame strength. There were also load guidelines and overloading, which as CASA has occasionally warned the public can either pull fixed wing aircraft out of the sky if one wing drops too far below the other, or, wings or tails can break. The practice of dipping buckets into water in turbulence and smoke is also too dangerous and has resulted in accidents. There are products and craft to meet these challenges.

Military turboprop aircraft such as the Hercules (capability = 16-20 tonnes of water), Caribou (= 4.25 tonnes) or possibly the Antonov (= 80 tonnes) have frames strong enough to comply with legislation and could have applied a line of fire suppressants in front of fires and well away from dangers of updrafts, smoke and turbulence. Current risks and huge expenditure would be removed using a rapid response attack within 30 minutes to an hour after ignition or when fires die down at night or early morning to extinguishable proportions. These aircraft are also designed to land on rough, small airstrips. There are products that have been tested, and according to manufacturers, are superior to retardants, which are dropped directly onto fires. Currently, retardants such as PhosCheck are so toxic they are banned from application near watercourses, which rules them out of general application as most dangerous fires are on water catchments. Helicopters can also be used, as supplementary support and preferably be military in design.

7. <u>The details and effectiveness of dispute resolution processes with respect to restitution of private property infrastructure damaged as a result of the fire:</u> A pattern has emerged of medium sized firestorms costing about $20 million each to fight, doing $100s of millions of damage and victims rarely able to overcome a tactic of governments using the best legal teams to prolong cases to exhaust plaintiffs financially.

<u>Cost Reduction</u>: I estimate rapid response/low intensity attack and hazard reduction strategies would have reduced the cost of firefighting and fire destruction by over 90%.

- Bushfire service operational costs could have been reduced by over 90% e.g. in NSW alone budgets are climbing, with the NSW Rural Fire Service going about $90 million over its 2011-2012 $343 million budget. In 2013-2014, the NSW RFS budget grew to about $370 million.
- A significant proportion of consumer insurance costs could also be saved e.g. insurance companies pay a levy that supplies 75% of the NSW RFS budget. This directly affects consumers, as their insurance premiums must pay for bushfire

insurance payouts, 75% 0f bushfire service funding and viable insurance company profit margins.

- Insurance payouts could be reduced by over 90% e.g. the 2003/4 NSW fires alone cost insurance companies around 0.5 $billion in payouts.
- Rapid response/low intensity attack and hazard reduction strategies could have saved legal claims for negligence against bushfire services and state and territory governments e.g. the 2003/4 fires generated claims against the NSW Government and the NSW Rural Fire Service of about $400 million. Teams of some of Australia's best lawyers exhausted many plaintiffs financially by prolonging cases. This shrank total damages/injury claims to around $40 million, but added to victims' trauma.
- Rapid response/low intensity attack and hazard reduction strategies could also have saved lost agricultural productivity from drought, preserved 100s of kilometers of fences and prevented other damage.

Pre-1788, naked Indigenous Australians managed the bush with no boots or even a box of matches. They taught early settlers these skills and oldtimers still remember a fuel-reduced firestorm-free past that cost the whiff of an oily rag.

References

[i] See McArthy, GJ; Tolhurst, KG & Chatto, K (1999) *Overall Hazard Guide* 3rd edn Natural Resources and Environment page 13; Gould, JS, McCaw, WL, Cheney, NP, Ellis, PF & Matthews, S (2007) *Field Guide Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Fores*t Australia: Commonwealth Scientific & Industrial Research Organisation (CSIRO) and Department of Environment & Conservation, Western Australia; CSIRO (2003) submission to A Nation Charred: Inquiry into the Recent Australian Bushfires Canberra: Parliament of Australia & Gould, JS; McCaw, Wl; Cheney, N, Peter; Ellis, PF; Knight, IK & Sullivan, Andrew, L (2008) *Project Vesta Fire in Dry Forest Fuel Structure Fuel Dynamics and Fire Behaviour* CSIRO Publishing Retrieved January 31 2014 from http://www.publish.csiro.au/pid/5993.htm.

[ii] See McArthy, GJ; Tolhurst, KG & Chatto, K (1999) *Overall Hazard Guide* 3rd edn Natural Resources and Environment pages 4-5.

[iii] See McArthy, GJ; Tolhurst, KG & Chatto, K (1999) *Overall Hazard Guide* 3rd edn Natural Resources and Environment page iii; Sullivan, Andrew (2008) *Grassfires fuel, weather and fire behaviour* 2nd edn pages 2-4, 17-21 & 29; Gould, JS, McCaw, WL, Cheney, NP, Ellis, PF & Matthews, S (2007) *Field Guide Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Fores*t Australia: Commonwealth Scientific & Industrial Research Organisation (CSIRO) and Department of Environment &

Conservation, Western Australia; CSIRO (2003) submission to A Nation Charred: Inquiry into the Recent Australian Bushfires Canberra: Parliament of Australia & Gould, JS; McCaw, Wl; Cheney, N, Peter; Ellis, PF; Knight, IK & Sullivan, Andrew, L (2008) *Project Vesta Fire in Dry Forest Fuel Structure Fuel Dynamics and Fire Behaviour* CSIRO Publishing Retrieved January 31 2014 from http://www.publish.csiro.au/pid/5993.htm.

[iv] See McArthy, GJ; Tolhurst, KG & Chatto, K (1999) *Overall Hazard Guide* 3rd edn Natural Resources and Environment page iii; Sullivan, Andrew (2008) *Grassfires fuel, weather and fire behaviour* 2nd edn pages 2-4, 17-21 & 29; Gould, JS, McCaw, WL, Cheney, NP, Ellis, PF & Matthews, S (2007) *Field Guide Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Forest* Australia: Commonwealth Scientific & Industrial Research Organisation (CSIRO) and Department of Environment & Conservation, Western Australia; CSIRO (2003) submission to A Nation Charred: Inquiry into the Recent Australian Bushfires Canberra: Parliament of Australia & Gould, JS; McCaw, Wl; Cheney, N, Peter; Ellis, PF; Knight, IK & Sullivan, Andrew, L (2008) *Project Vesta Fire in Dry Forest Fuel Structure Fuel Dynamics and Fire Behaviour* CSIRO Publishing Retrieved January 31 2014 from http://www.publish.csiro.au/pid/5993.htm.

[v] See Richard Williams & Imogen Fraser (2013) Alpine grazing: does it reduce blazing? A large body of evidence shows that it does not. Retrieved from *Ecological Society of Australia* Retrieved January 31 2014 from https://www.ecolsoc.org.au/hot-topics/alpine-grazing-does-it-reduce-blazing & Mooney, Scott D; Radford, Kate & Hancock, Gary (2001) clues to the 'burning question': Pre-European fire in the Sydney coastal region from sedimentary charcoal and palynology *Ecological Management & Restoration* vol 2 no 3 December pages 203-12.

[vi] See Richard Williams & Imogen Fraser (2013) Alpine grazing: does it reduce blazing? A large body of evidence shows that it does not. Retrieved from *Ecological Society of Australia* Retrieved January 31 2014 from https://www.ecolsoc.org.au/hot-topics/alpine-grazing-does-it-reduce-blazing & Mooney, Scott D; Radford, Kate & Hancock, Gary (2001) clues to the 'burning question': Pre-European fire in the Sydney coastal region from sedimentary charcoal and palynology *Ecological Management & Restoration* vol 2 no 3 December pages 203-12.