House Select Committee on the recent Australian bushfires
Inquiry into the recent Australian bushfires
House *of* Representatives
Parliament *of* Australia

To the Committee

I have just submitted my thesis for a Doctor of Sociology at the University of New South Wales. In it, I find compelling problems with contemporary bushfire management and a lack of high-level research. A large body of evidence shows that the bushfire problem is serious and management practices in compellingly urgent need of change.

My findings for the Committee's Terms of Reference are as follows:

(a) the extent and impact of the bushfires on the environment, private and public assets and local communities

Temperatures of wildfires can be in excess of 3,000°C, depending on fuel loads. I do not have the data to estimate the total damage to soil, flora, fauna, Aboriginal sites, air, water, private and public assets and the community. I do have the knowledge to say the impact of slow, low intensity hazard reduction burning is minimal compared to the catastrophic impact of wildfires. Furthermore, slow, low intensity hazard reduction burns are humanly controllable.

The cost of saving a handful of buildings in a battle against the impossible odds of wildfires has been estimated at around $100 million per outbreak. In the end, despite the trucks, helicopters, radios, computer maps and other technology, only rain extinguishes wildfires. They are traumatic and dangerous experiences for communities and emergency workers. Wildfires generate their own weather. They produce wind changes (that can turn on firefighters to incinerate or injure them) and wind speeds of up to 200km/hr. From the accelerated dynamics of these changed systems, fireballs can ricochet unpredictably around and fire tornadoes form. Wildfires are complex or chaotic systems, which follow patterns, but which, confoundingly, are also unpredictable. As complex systems, it is an impossible task to know which structures will explode into flames, once

wildfires began their meandering path through urban subdivisions. Human intervention "fighting" these fires has proved that only a few properties can be saved as firefighters battle impossible odds taking enormous risks.

Damages include loss of property, livelihood and personal injury. Personal injury can be psychological; for example, the debilitating post traumatic stress disorder, which often has no cure. Similarly, people have their lives ruined by grief. This grief can be from a combination of factors or one factor alone such as the loss of a loved one, personal property or the loss of livelihood. Personal injury can also be physical.

The tragedy that befell Mr Luke McSweeney is a good example of someone who suffered personal injury that was both physical and psychological. He was involved in a National Parks and Wildlife Service hazard reduction that turned into a wildfire due to inadequate knowledge of the environmental factors leading to wildfires in June 2000. Four died in this attempt to hazard reduce in bushland with dangerously high fuel loads. As a consequence of this tragedy, the National Parks and Wildlife Service has since been hesitant to hazard reduce, resulting in the high fuel loads, which brought tragedy so recently to NSW and the ACT.

Time limitations prevent an estimate of the total personal injury and property damage of recent bushfires. According to newspaper reports, in NSW, two people died in the 2002 fires and one in 2003. In 2003 in the ACT, four were reported dead and around 400 homes lost along with the historic Mt Stromlo astronomical observatory, its records and telescopes.

(b) the causes of and risk factors contributing to the impact and severity of the bushfires, including land management practices and policies in national parks, state forests, other Crown land and private property.

It is a painful task for me to say that the previously outlined damage was avoidable. Adequate hazard reduction was the underlying factor for the fires. In NSW, the neglect of hazard reductions was due to inadequate intensively evidenced information guiding decision making, policy and legislation in relevant government bodies such as the National Parks and Wildlife Service, the NSW Department of Land and Water Conservation, the Nature Conservation Council, PlanningNSW, the Environment Protection Authority NSW, local government and Bushfire Management Committees. The NSW Rural Fire Service was complicit in its lack of protest over these government bodies' increasing tightening of restrictions on hazard reductions. In 2002, Commissioner Phil Koperberg denied that hazard reductions prevent wildfires at a NSW Parliament inquiry into whether hazard reductions prevent wildfires.

Curiously, the Newcastle Herald reported Commissioner Koperberg telling the committee that flames 1.5 m high can be produced by ploughed paddocks. His complicity was despite frequent mention of the compelling need to hazard reduce in his service's training, manuals (see Bush fire Council of N.S.W. Bush Fire Personnel Training Module BP/6 Hazard Reduction) and other literature (see fire! THE AUSTRALIAN EXPERIENCE 1998, NSW Rural Fire Service pp 27-33). In the BP/6 Hazard Reduction module, the criteria for a need to burn are vague, with fuel loads of 30 tonnes per hectare understated as necessary for a wildfire. In fire! THE AUSTRALIAN EXPERIENCE, 15t/ha are said to lead to wildfires. Furthermore, burning is described as necessary for biodiversity. From my fieldwork, I quote a brigade captain who described inadequate hazards reductions as the cause of the 1993/4 fires in NSW. He said:

> Most of the big fires started in national parks because they didn't want to burn off until there were fuel loads of 23 tonnes per hectare. It is well recognised now that any area above 15 should have firebreaks around it. I think seven to nine is ideal as a benchmark and fairly controllable if it catches on fire. Bush should be reduced to seven to nine and then allowed to build up again...There are places that are up to 60 tonne at the moment. You can't carry enough water to put out a big fire, so you put it out with fire. You back burn...run a fire into a fire. Fire changes the direction of the wind and can be used to pull another fire into it. When they meet, there is nothing left to burn...then you damp down by putting out the edges.

He indicated that loads far less than 30 tonnes per hectare were likely to produce wildfire, depending on environmental factors such as wind, humidity, temperature and moisture in the ground. For example, bush, which is wet scleroforest, is unlikely to burn because it is usually too damp. This rainforest can burn in conditions where it so hot and dry that the leaf litter in its understorey has dried out. According to informants, rainforest regenerates as rainforest after burning. It is however, possible that repeated burns will slowly convert rainforest to dry scleroforest. There is evidence to suggest that dry scleroforest has changed to wet scleroforest once Aboriginal and early settler burning ceased. For example, the rainforest overlooking Wollongong and on the Atherton Tablelands is said by scientists such as Dr Timothy Flannery to have once been dry scleroforest. Aboriginal elders acting as informants in my research were of the opinion that anything that can burn should be burnt.

The evidence points to the environmental dynamics of wildfires as complex systems where patterns emerge, but where the unpredictable can occur. Currently, coastal rains continue in NSW. The wildfire danger is ever growing. As rain feeds undergrowth, attempting hazard reductions can bring wildfires,

personal injury, loss of property and unnecessary environmental damage. A failure to act swiftly using the most stringently evidenced procedures for hazard reductions is a further reason for the current wildfire crisis. Organisational change, informed by intensively evidenced information is necessary to achieve this goal, and, has so far been lacking. For government employees of bodies such as the National Parks and Wildlife Service, damages for personal injury were long denied. Mr McSweeney only received compensation after a NSW Parliamentary debate in 2002, two years after his injuries.

I found that philosophies guiding relevant government agencies were gravely misinformed when it came to bushfires. In NSW and the ACT, networks of government agencies implemented policies that saw buffer zones such as parks and roads around houses as adequate protection. Outside of these buffer zones, a philosophy of letting nature and Aboriginal sites take care of themselves allowed bushland to build up dangerously high fuel loads as year after year, hazard reductions were reduced. Added to the problem, many houses lack buffer zones, with fences fronting national parks and other bushland. It has been an experiment that has failed and that had no intensively evidenced data to justify its implementation.

The myth that reducing hazard reduction best protects biodiversity and Aboriginal sites has had dire results. This myth has reproduced throughout relevant government agencies. Filtered out in the vetting of graduates with science and other relevant degrees in these agencies' recruiting has been knowledge from Indigenous Australian education units at universities all over Australia. In recruiting advisers and employees, crucial knowledge has been swept aside from high-level doctorate and postdoctoral analyses from distinguished researchers such as Drs James Kohen, Timothy Flannery and Phil Cheney (CSIRO). The 2002 Joint Select Committee on Bushfires had to be reopened twice because inconvenient knowledge had been ignored in the committee's initial finding that hazard reductions do not prevent wildfires.

In my doctorate, I reviewed scientific literature on bushfires. According to scientific evidence, fire has been a part of the Australian bush since the end of the last ice age as scleroforest replaced wet and dry rainforest with the Australian continent's expansion and drying. Evidence of carbon particle size from core samples suggests that these fires were not wildfires. A large body of evidence shows that over the last five millennia, Aboriginal people always hazard reduced, leaving a wide variety of flora and fauna, many of which have become extinct under white management. Aboriginal sacred sites survived these Aboriginal burns. In contrast, wildfires pose a serious threat to Aboriginal sacred sites (particularly where there are bones), the soil, water, flora and fauna. Early settlers followed Indigenous Australians' example, hazard reducing in the

knowledge that to fail to do so would create conditions where they and their environment faced incineration.

Bushfires only started to impact as problems once hazard reductions were reduced with government legislation and policy forcing this change (see The Forestry Act 1916 NSW). This began in NSW with the Forestry Act 1916 (NSW) and the creation of the NSW Forestry Commission, which in the 1920s introduced a no-burn policy. The restrictions on hazard reductions have ever increased, as has the frequency and intensity of wildfires. My analysis proves that bushfires were unproblematic until the 1920s when ever tightening restrictions on hazard reductions and denser undergrowth combined with hot, dry weather.

After reviewing scientific and historical data on bushfires, my own research looked to corroborate competing claims from different knowledge fields. I could no find no evidence for advocates of a no-burn policy. The argument that wildfires were once unproblematic in Australia was corroborated in my archival analysis of a century's articles on structural fires (ie buildings etc) and bushfires between 1881 and 1981 in the Newcastle Herald and its associated publications. The Newcastle Herald ran national and local stories showing that structural fires have always been serious problems.

In the late 19th and early 20th centuries, a significant section of the population lived in rural locations performing activities such as timber cutting, mining, farming and constructing public works such as the Sydney to Newcastle Railway. People used fire as their principal energy source. However, bushfires, unlike structural fires were not a problem. Fire stories covered in the Herald reflect this finding on a national level. It must be remembered that areas now densely populated such as Kings Cross were in the late 19th century, places where there were tall native trees, cow and horse paddocks and fauna such as koalas.

At the time of settlement and later colonisation, historic references to bushfires indicate that these fires were likely of Aboriginal origins and were not wildfires. Carbon core samples of carbon particle size also indicate that these Aboriginal fires were not wildfires. Traditionally, Indigenous Australians used fire for many purposes besides cooking, heating and lighting. Its uses included: as a means of warfare, for hunting, to send smoke signals, to clear the bush of scrub to make it more difficult to be taken by surprise by enemies and to make travel more comfortable by removing undergrowth and to keep undergrowth down to prevent incineration. Much data has been lost to categorise the reasons for burning in many early settlers' reports, but some accounts do give reasons such as noting that Aborigines burnt before winter rains. Besides the need for more

accurate information guiding government administration of wildfire mitigation, my experiences in my fieldwork point to a need for change at the grass roots of bushfire management. The standard of understanding and ability to perform necessary tasks was variegated.

In my fieldwork, I was directed to the Cessnock region, where, because I was doing a gendered analysis, I would find significant instances of women firefighters who were successfully leading men as captains and brigade captains. One woman was a fire truck driver. The women I interviewed impressed me as intelligent, articulate, fit and well able to deal with the tasks of bushfire suppression. Informants told me that the area also had one brigade where women never joined because an anti-woman philosophy would make their lives miserable. Another brigade was described scathingly as prone to panic and outbursts of screaming rather than staying in control of the situation by retaining one's wits. To gather this data, I did semi-structured interviews. To gain a more in depth understanding, I joined my local brigade and did 12 months' as a volunteer bushfirefighter.

In my brigade, the demographics were very different to those I interviewed from Cessnock. My participant observation informants had lower educational levels and were comparatively inarticulate. There had been a large intake of newcomers from outside the brigade's hamlet. They were drawn by publicity over the 1993/4 fires. Cessnock women told me that the motivation for adrenaline thrills makes a poor firefighter. Such recruits, drawn by post-wildfire publicity rather than the goal of protecting their own property, often presented problems, according to these women. The women at Cessnock all expressed determination to protect their own property and families, a factor that was missing from accounts of many newcomers I talked to in my own participant observation brigade.

At my participant observation brigade, there was frequent mention of marijuana and in one instance two volunteers passed each other a joint just before training. Two drivers habitually smelt of alcohol. There was a great deal of tension in the brigade and in a hazard reduction, hoses were dragged over rough and burning ground and damaged because so much attention was focused on who was holding nozzles. I was told that a firetruck caught on fire during the making of a promotional video showing a woman deputy captain who was later appointed at this brigade. She habitually wore an interesting décolletage under her regulation overalls, revealing a bodysuit and an expanse of bosom unlikely to be supported by regulation pure cotton or wool underwear. The bodysuit too, was unlikely to have been of regulation material. In comparison at Cessnock, informants were plain dressers and described being in control of their situation during the 1993/4 fires. Several stories were proudly told of defying orders from Rosehill Rural Fire

Service headquarters to save a township with a backburn. There were accounts of a woman captain who most intelligently and bravely delivered back her firetruck and men unharmed after being caught for many hours in a wildfire without radio contact during the 1993/4 fires.

In contrast, in the brigade of my participant observation, there were many stories told where the men were clearly not in control of their circumstances and blamed orders from Rosehill headquarters for their failure to deal with the 1993/4 catastrophe. Trucks were ordered far away in response to fire calls, which proved bogus. This left areas unprotected where real dangers approached. One group captain said he developed "truckloads" of post traumatic stress disorder because of the stress. At one point, to escape danger, he said he drove a bulldozer through wildfire. He said he was also ordered to carry on without sleep for three days with firefighting crews and their five trucks under his command. As fire approached his five trucks, he said he felt so stressed that he vomited. He described finally returning to his home and collapsing with exhaustion on his front verandah. The fire had passed through and could not be extinguished and as he repeatedly stressed in his accounts, he found "not being in control" of wildfires frustrating and difficult to accept.

(c) the adequacy and economic and environmental impact of hazard reduction and other strategies for bushfire prevention, suppression and control

As outlined in sections (a) and (b), a large body of evidence shows hazard reduction and other strategies for bushfire prevention, suppression and control are far from adequate. As to economic impact of adopting alternatives, the amount of money spent in creating and administering the current wildfire situation is beyond the time limits for this report to estimate. As stated previously, the cost of fighting a wildfire outbreak is around $100 million. According to the NSW Rural Fire Service's annual report, in the financial year ended June 2002, its total expenses were $179,218,000. Most of this money was spent on Program 1 for funding and administering rural firefighting services. The expenditure for Program 1 in 2002 is about double that of its previous year moving from $88.551M in 2001 to $174.343M in 2002. The amount of monies consumed in the administrative costs of associated government bodies has not been estimated, but would add to the costs of the creation of a government machine which has as its overarching goal, the implementation of a no-burn policy where "fighting" fires has been seen as the solution to wildfires.

(d) appropriate land management policies and practices to mitigate the damage caused by bushfires to the environment, property, community facilities and infrastructure and the potential environmental impact of such policies and practices

As stated in the preceding and following sections, appropriate land management necessitates provision for large changes in the management of bushland. This policy needs to incorporate burning, clearing and perhaps grazing of bushland. It is quite likely that with adequate hazard reduction, current buffer zones will be adequate protection from fire. However, vigilance during hazard reductions is essential as embers can travel into subdivisions and careful monitoring is required.

(e) any alternative or developmental bushfire mitigation and prevention approaches, and the appropriate direction of research into bushfire mitigation

Currently, careful, intensively evidenced information is necessary to reverse the growing wildfire catastrophe. Historical information shows that hazard reductions were once done according to the suitability of conditions for burning slowly and safely. This was a spur of a moment activity, not subject to careful vetting by bodies such as Bushfire Management Committees, the EPA and the National Parks and Wildlife Service. By acting quickly, when conditions presented as suitable for hazard reduction, the bush was once protected adequately from wildfires. The vast tracts of dense bush no longer allow hazard reductions to be treated in this ad hoc fashion. High fuel loads mean that plans to hazard reduce may backfire without careful assessment of environmental factors. To reach this goal, intensively evidenced information is necessary.

To achieve this, a think tank of experts who have proven track records in providing relevant and accurate information is necessary. From my doctoral work, providers of such information include Aboriginal elders such as Mr Ken McBride (c/- of Wollatuka, University of Newcastle and Mr Raymond Speedy McGuiness 08 89760386 or kriolspeedy@hotmail.com, Lok-Cabay, Batchelor NT 0845), senior volunteers such as retired Deputy Captain Kurt Lance (AM), scientists such as Dr Phil Cheney (CSIRO), meteorological experts such as Mr Martin Babakhan (Aviation & Technology, University of Newcastle) and NSW Rural Fire Service Fire Control Officers such as Deputy Fire Control Officer, Chris Anderson, Baulkham Hills Fire Control.

Techniques to safely hazard reduce in increasingly difficult circumstances have proven fairly effective in the Baulkham Hills area of Sydney. I would like to point to the fact here, that wildfire from the Baulkham Hills Shire did escape into

Hornsby in the most recent Christmas fires, so this method requires to be more heavily combined with hazard reduction burning. Tritters (resembling bobcat earthmovers, with fittings to chop scrub to mulch) were used in this area to clear undergrowth. The use of tritters over the total expanse of bush requiring burning would be too cumbersome. However, tritters can provide safety areas for escape during hazard reductions and can clear key areas, which would be likely to erupt into wildfires after they are set alight. Other techniques include burning downhill from ridgetops, as this makes fire move slower. In very dense areas where even burning down would likely lead to wildfires, backburns can be lit from below to run into, and, extinguish fires. It should be noted that backburns lead to very intense and destructive temperatures (records of in excess of 3,000degC) and should only be used where no other technique will provide adequate protection from a fire getting away.

There is also evidence that around seven millennia ago in Australia, burning was less frequent. This was most likely due to the presence of herbivorous megafauna that ate enough vegetation to keep the bush in less need of burning. There was the wombat-like *Diprotodon*, about the size of a Volkswagen beetle. There were also a number of species of four-metre-tall kangaroos and several species of birds taller than emus. Research is necessary into the use of animals to clear native bushland as megafauna used for grazing now are not Australian in origin and will cause damage from their hooves. One research possibility is breeding programs aimed at recreating Australian native fauna like giant wombats and kangaroos. Livestock has been bred according to size as a tradition and there is reason to believe that these types of herbivorous megafauna cannot be recreated. They will provide a less detrimental impact on the environment than a reliance on burning alone in the prevention of wildfires. Another possibility is the introduction of more native grazers into bushland through breeding programs. As with the megafauna, these animals provide roadkill and provisions for cheaply fencing bushland from roads requires research.

More research is necessary before conclusions can be drawn, but it is also likely that in extremely hot dry conditions rainforest, too, may be a source of wildfire. Given the enormous sentiments of the general public and the many unknowns of sustainable bush management in temperate and subtropical areas, such measures should only be considered once intensively evidenced investigation shows if, how and when this might be beneficial rather than detrimental to the environment. To make an error in such a sensitive area would be a public relations and environmental disaster.

The evidence points to the environmental dynamics of wildfires as complex systems where patterns emerge, but where the unpredictable can occur. More research is necessary to ascertain what should be hazard reduced and to provide

more stringent requirements for training, fitness, attitude and educational levels of personnel performing hazard reductions. The implementation of hazard reduction programs also needs to be monitored and intensive evidence gathered to ensure that goals are being met. Safety issues also require careful monitoring using intensively evidenced research. A list of burning priorities needs to be assembled and worked through according to urgency and environmental conditions. A think tank also needs to be assembled to devise economically feasible ways to assemble a workforce large enough and well-trained enough to safely hazard reduce, as a large body of evidence shows that hazard reductions need to be implemented speedily and with great care. It must be noted that Aboriginal people followed by early settlers, once adequately implemented hazard reductions. The initial work to adequately hazard reduce wildfire prone bushland will require a short-term intensive effort because of the difficulties imposed by current fuel loads. Once the loads are reduced, there is no reason to suppose that this intensive effort will need to continue long-term. Pre-white settlement, the average population density of Aboriginal people in fire-prone regions in NSW has been estimated at one person per two square kilometres and this estimate includes people who were not a part of burning activities.

Research is needed to ascertain how safe current buffer zones will be during hazard reductions and the effects on subdivisions and structures fronting bushland during hazard reductions. Research is also needed on the questions posed in section (f) on planning and building. Research is also needed to examine liability, insurance coverage and related matters in light of the now overwhelming evidence that large bodies of knowledge have been ignored to implement no-burn policies and tighten restrictions on hazard reduction. Research is also needed in devising ways to recruit firefighters who are adequately fit, intelligent and psychologically committed to the goal of fire prevention rather than the adrenaline thrill of *fighting* fire. Furthermore, dealing with trauma from stress also requires research. Whether or not counseling is an effective antidote for trauma (as is currently commonly accepted) has never been confirmed with research. Two studies on the affects of counseling indicate that counseling may even be detrimental and at best has been found to have no positive effect. Added to this, research on postraumatic stress disorder shows that the most important factors in avoiding this debilitating disorder is high morale within an organisation and a supportive home environment.

Once accurately informed strategies have been devised to reverse the current crisis, research is also needed to develop ways to best inform the public and to monitor the implementation of the new strategy.

(f) the appropriateness of existing planning and building codes, particularly with respect to urban design and land use planning, in protecting life and property from bushfires.

As stated in the previous sections, existing practices have proved inappropriate. This topic needs detailed research to assemble an understanding of where current practices fail and ways this shortfall may be addressed.

(g) the adequacy of current response arrangements for firefighting

As stated previously, particularly in sections (a) and (b), the current response arrangements for firefighting have been most ineffective for complex reasons, but primarily because humans are relatively powerless in the face of wildfires. A preventative strategy has proven highly effective in the past, as well as vastly inexpensive.

(h) the adequacy of deployment of firefighting resources, including an examination of the efficiency and effectiveness of resource sharing between agencies and jurisdictions

As stated in previous sections, particularly (a) and (b), the deployment of firefighting has been inadequate for complex reasons, but primarily because humans cannot stop wildfires. And so, "fighting" them is dangerous, costly and ends only when heavy rain extinguishes the fires. As stated in (b) and (h), the effectiveness of sharing between agencies and jurisdictions has been guided principally by a no-burn policy and so, has been ineffective.

(i) liability, insurance coverage and related matters

Liability for damages may prove problematic in view of the large body of evidence I have outlined in (a), (b) and (c) that government agencies ignored intensively evidenced information of a wildfire managed past to implement a no-burn policy. The evidence that I have outlined indicates that a case against government agencies for dereliction of duties may prove successful.

(j) the roles and contributions of volunteers, including current management practices and future trends, taking into account changing social and economic factors

As stated in pp 6-7 of (b), volunteers in brigades dealt with the wildfire problem in variegated ways. By their inaction in protesting against tightening restrictions on hazard reductions, many fall into a category which can be said to be that of passive arsonists. Their enthusiasm for *fighting* rather than *preventing* wildfires underpins the current wildfire crisis. There have also been newspaper reports of volunteers prosecuted for actual arson. A spirit of unrest was often observable at the brigade of my participant observation. Members talked longingly of a fire and would nostalgically inhale the smoky smell from their facemasks. The adrenaline thrill of fire fighting was commonly reported. From my own experience in hazard reduction burns, fire does heighten the senses, bringing a sense of euphoria. I experienced this sensation and observed it in other participants of burns. It is an unpleasant task to report that the euphoria of simple hazard reductions is not enough for some volunteers.

As to controlling and vetting volunteers to the standard of other emergency agencies, I doubt this can be done with current practices for taking new members and possibly not at all for volunteers. When I rang Commissioner Koperberg and asked him for a comment on my observation that some members took drugs and two truckdrivers often smelt of alcohol, he replied that they were just volunteers. Fitness levels were another problem. Many were overweight and unfit, two reported post traumatic stress disorder. Informants told me of one new recruit who had died from a heart attack during volunteer brigade activities. Adding to the problem, counseling was needed for those who were involved in the heart attack incident. Many members in the brigade of my participant observation expressed resentment that their labor was unpaid. Antagonism towards headquarters was frequently mentioned over the need for better trucks and other equipment. It is my contention that if the bushland had been adequately hazard reduced, the equipment necessary in brigades would not be at the levels of sophistication now considered obligatory. Aboriginal people, once scantily clad and currently usually barefoot and wearing a singlet and stubbies, hazard reduce as a mundane activity. The technology guiding them has proven invaluable and is purely an encyclopaedic knowledge of their environment.

Yours sincerely

Christine Finlay

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