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COUNCIL OF AUSTRALIAN GOVERNMENTS

ENVIRONMENT AND NATURAL  
RESOURCES COMMITTEE

*Inquiry on Bushfire Mitigation and Management*

Submission by  
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4 Dec 2002

***Introduction***

This submission addresses some of the political and administrative issues that have emerged as Australia grapples with bushfire and fuel management.

I have provided this submission as a viewpoint based upon 45 years of involvement in bushfire research in Australia. This is not a rigorous review of the current knowledge of bushfire science but a personal and I hope expert opinion on the very important role of fire in the Australian environment.

***Background***

About 1980 CSIRO closed down one of its two dedicated bushfire research groups and actively discouraged any remaining bushfire research. The grounds for this policy was that fuel reduction burning had effectively solved this serious Australian problem. It was also considered that the major factors determining fire spread were now understood.

The inescapable fact is that if fuel builds, as it does, to dangerous levels a conflagration must result at some time in the future. Frequent mild fires in the appropriate forest types as practiced by the aboriginal people removes the forest fire phenomena as a problem. Scientifically this assessment was correct.

Unfortunately CSIRO was not very successful at achieving the application of its scientific advances and the lack of support for the application of fuel management lead to its demise as an effective environmental tool.

For almost three decades State and Commonwealth governments have been warned of the potential of a 1939 repeat fire disaster. Those warnings by fire managers and fire researchers have been ignored, discounted or discredited. Well the disaster is here, the response has been to deny, hide and deceive. There has been no acceptance of responsibility or action other than spin and deception and a policy of silence. An illustration of the extent of this deception was the on air comment from an award winning ABC journalist who has become an apologist for the Victorian CFA. He referred to the most damaging forest fire in Australia ever as 1.3 million hectares of

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prescribed burning. A moments thought will reveal the spin, deception and ignorance within that statement.

The motives for this disgraceful public response are entirely political and reinforces the politics of marginal preferences. Fear of litigation from its rural citizens is also a major motive. The state is not entitled to hide its responsibility for this environmental disaster from its own citizens.

### **The Risk Today**

The fuels in our forest environments have been allowed to build to such a level that the inevitable wildfire has a most damaging heat release and an elevated fire spread rate. The energy releases are thermonuclear in scale. It can be safely stated that the energy release in the 2003 fires in NE Vic and SE NSW was equivalent to some 50,000 Hiroshima fission weapons. The outcome was catastrophic.

The values at risk are our environment, water supplies, infra structures, homes, life loss and injury.

Solutions are attainable but are complex, politically difficult and expensive. However the difficulties are much less than the alternative of allowing unrestrained fuel increase and hoping that suppression will be effective.

### **Opposition to Fuel Management.**

A fuel management solution that would create a safe and healthy forest environment has been opposed by two significant groups who have an interest in maintaining our high-risk environment.

The first group is a minority of environmentalists who have a belief that "Broad-scale hazard reduction is threatening biodiversity conservation and must therefore be avoided by land managers and resisted at a political level." (House of Reps. Committee 2003, Minority report) There is no apparent recognition by proponents of this point of view of the threat to bio diversity by the enormous areas of high intensity fires that have extended though out the high country. This group is politically very active and has achieved a control over state governments far greater than either their numbers or their science supports.

The tragedy of this response is that the resulting infrequent high intensity fires will result in massive environmental change including stand replacement and other extreme ecological effects. The very values sought to be protected by fire exclusion are finally destroyed.

This group has been dismissive of the legacy left from aboriginal management of our environment and equally dismissive of the large number of academics that have sometimes spent a lifetime studying aboriginal use of fire.

There have been many studies that support the view that frequent mild fires is the pre European condition for much of our forest areas and our biodiversity depends upon it. Amongst the first was A.R.King's analysis of early explorers records published in 1963 up to "Forests of Ash" (Tom Griffiths), "the future eaters" (Tim Flannery) and of course the many books by Steven J. Pyne.



25 MAY 2007

The second group that resists fuel management by use of various arguments notably the "lack of weather opportunity" is the fire agencies themselves. A solution to the fire problem in Australia would threaten a large industry and erode their power built upon massive public relations activities and spin.

Cheney stated this view correctly "As one former CEO put it "Why should I carry out prescribed burning? All I get is criticism about smoke and destruction of habitat and biodiversity, and my staff are vilified by people who know nothing of fire suppression and don't care a fig about managing the forests. I (personally) would be better off to let the fuels accumulate, have larger wildfires and have my people hailed as heroes" (Cheney "Economic rationalism, fear of litigation and the perpetuation of disaster fires" ANU Fire Forum, 19 – 20 Feb 2003.)

I have no evidence of any formal or informal connection between these groups. Within the groups there will be many informed people who will have a contrary view but are restrained from expressing them (even to parliamentary inquiries) either by group think or in the case of Victoria, official "guidelines".

Governments both State and Federal are played for all they are worth by these groups by spin and distortion. The Commonwealth government must develop structures that cut through the spin and distortion, foster and support free and open study and debate.

### **The Technological Solution.**

The ever increasing suppression expenditure on suppression and decreasing prevention expenditure would be acceptable if it were effective. Unfortunately 3.1 million burnt hectares, 400 homes and Mt Stromolo observatory burnt testify that suppression alone is not effective without extensive fuel reduction.

If it is thought that the solution lies in more expenditure, more helicopters more public relations and larger five star conferences then contemplate the fate of California the wealthiest and most technology rich state in the world and even with "The Terminator" in charge is just as vulnerable as we are. Only fuel management will yield healthy and safe forests, continued water and timber yields and secures communities.

### **Understanding the bushfire threat.**

The urbanized Australian, our administrators and many of our leaders remain ignorant of the enormity of the scale of a high intensity bushfire. Its inevitability and environmental, water resource and infrastructure destruction remain unrecognized.

The Federal Government must establish or support a rigorous and independent analytical capability to provide a balance to the fire agency domination of research, education and advice. In fact there are many views and arguments about the role of fire in the Australian community (including and especially the indigenous view) and they must all be available to the Australian people and their Governments.

The now notorious Esplin Inquiry through its appalling procedural unfairness, stacked composition and erroneous conclusions is an example of the control achieved by the fire agencies and extreme conservationists.

The interlocking domination of some fire agencies and their leaders through control of national fire policy, national fire research, national fire education and even control of the political process has delivered the Australian people and their forest environment into the current extreme risk.

### **Government action.**

The federal government must through its support of independent and often dissenting views encourage balanced research to assist in policy formation which must be in the hands of the accountable politicians and not, as now, in the control of uncountable quasi beaurocrats. Failure to do so will continue to put us in harms way and deliver more great ecological and human disasters.

State and Territory governments have shown themselves to be incapable now of dealing with the excessive fuel situation. The risk is extreme and it is defensible to suggest that the risk to the nation is greater from bushfires than from external threats. That external agencies could use the bushfire danger to achieve a crippling attack on the nation must surely be obvious and alone a reason for the Commonwealth to take a critical and objective interest in the rural fire problem.

It must be bad public policy to make use of orchestrated enquiries to justify pre-determined outcomes. The strategies are obvious and comments made to me by rural folk would suggest that the people are not fooled. This strategy is defacto government by beaurocracy as they are just about the only groups able to prepare glossy and extensive submissions on which the outcomes are inevitably based. Expert opinion and the common sense and experience of the population never get a look in.

This "Voyager 1". Process will lead to "Voyager 1" outcomes. The Esplin inquiry has been a classic and notorious example of this process.

However the House of Representatives inquiry because of its multi party composition, privilege protection, immaculate processes for obtaining and recording evidence, openness and use of minority reports has yielded a legitimate outcome. Another example of an excellent report showing the balance and complexity that the problem commands has been the House of Reps Milton Standing Committee on the Environment (1983).

The Commonwealth Government with or with out the State Governments must fund independent bushfire studies in those universities that can demonstrate a capability to develop an objective risk assessment, fire behaviour modelling and teach and undertake fire forensic studies so that we can actually learn from our mistake.

The establishment of the Bushfire CRC, dominated and controlled by the fire authorities will not produce objective analysis for public policy formation. The CRC is dubious in its program and constrained by its strong and directive board. Monash University showed wisdom and academic responsibility but withdrawing from the CRC. Not a formula or structure for successful research.

These are strong views and will be challenged I am however willing to justify them in person if required. May I make one point however and that is the lack of resources available to independent citizens enables the fire agencies and other well-funded pressure groups to dominate the outcomes.

Submission to

*Attachments*

**Victorian Bushfire Inquiry 2003-**

**David Packham**

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This submission does not encompass anything more than the mere essence of the relevant conclusions that I have reached during the last forty-five years of professional bushfire research. I was employed by CSIRO, The Department of Defence, Monash University and The Bureau of Meteorology during this time. My last position was as Supervising Meteorologist for Rural Fires at the Bureau of Meteorology. My bushfire research was recognized with an Order of Australia Medal.

My research has encompassed fire chemistry, fire physics, prescribed burning development, smoke, human and building survival, fire behaviour, disaster management, fire policy, and fire weather.

The result of this experience has forced upon me certain conclusions about the role of fire in the total Australian environment. The conclusions are mostly at odds with the prevailing policies currently in place in Victoria. These policies have failed in the past, are failing now and will fail in the future. Surely over a million hectares of burnt and damaged forests proves my assertion.

The current policy of fire exclusion (1.05% of prescribed burning is still fire exclusion), fire control through technology and the decrease in capacity for initial attack and the exploitation of volunteers is totally unsound.

Current policies do not actually recognise the facts of fire behaviour, fire meteorology, the scale of disaster fires, the community nature of volunteers and the essential requirement of burning for a healthy natural environment.

The bushfire "problem" is multifunctional and requires an understanding at the scientific, environmental, social, economic and political levels. Developing appropriate policies is not achievable by "Yes Minister" type inquiries such as this one. Only the most robust, honest and open debate can achieve a unified state and national approach to living with fire.

Government and bureaucratic response to the recent fires has been divisive, callous and dismissive. Pre-emptive statements from the Premier and Ministers and some Departments have destroyed any atmosphere for a unified fire policy development.

The 2003 fires are a result of the failure of Victorian Governments and Bureaucracies to ensure the safety and health of the land under their control and custody. The failure of the Government to acknowledge this fact in the fear of litigation will preclude a positive outcome to this major environmental and social threat.

Possibly the most dangerous factor in the Victorian fire threat is the determination of the Victorian Government, Departments and Agencies to ensure that dissenting voices be not heard.

I do not imagine that this inquiry will achieve anything more than a politically acceptable conclusion and as a result the threat next year and thereafter will essentially remain the same. I however always live in hope.

### **The Fire Threat in Victoria**

- In Australia, in the last 100 years, 600 fire deaths have occurred, 400 in Victoria.
- Victoria, because of the Southwest cold front has the world's worst fire climate.
- The fire exclusion policy has resulted in the highest and most dangerous fuel loads for 47,000 years.
- A running disaster fire intensity exceeds the maximum capability for fire fighting by between 4 and 80 times.
- The environmental, industrial and social costs will increase as the extreme fuels closer to Melbourne experience the inevitable mid summer disaster wildfire.
- The ecological threat is extreme.
- The threat to Melbourne's and the States water supplies is certain to be realised in the next few decades – the water harvest will be decreased to half for 30-50 years within the next 50 years.
- The hardwood timber industry will be obliterated.
- The rural/urban interface will experience a major civil disaster greater than but similar to Hobart in 1967.
- We remain very vulnerable to arson from disgruntled citizens and external forces.
- The fires in Gippsland and the NE were predictable and have been expected.
- If an objective, unfettered and independent analysis of the East Gippsland and NE fire disaster were made I would expect to find that the fire fighting (\$2m per day) made little if any difference to the outcome. The predicted daily spread was usually achieved.
- The dramatic demonstration of the predicted potential destruction of the Bass Link project by wildfire has been totally ignored, putting the State at considerable financial risk.

### **Fuel management**

- The fires in W.A. during cyclone Alby demonstrated beyond doubt the efficacy of prescribed burning.
- Reducing the dry sclerophyll fuels to an average of one quarter will reduce the fire intensity (and the damage) to one sixteenth.

- Reducing the fuels to one quarter will reduce the areas burnt to between one quarter and one sixteenth.
- The application of frequent mild fire as was practiced by the indigenous people is essential for a healthy Australian environment.
- It will take two decades of effort to achieve healthy fuel levels. There is however no alternative except major fire disasters at the rate of one or two per hundred years.
- An honest public education effort without propaganda and spin will be needed to achieve support for fuel management.
- Sufficient and supported fire research to develop and refine burning techniques for Victorian fuels, topography and climate is needed. The dubious and constrained proposed CRC will not suffice.
- There is a demonstrated capacity of fire fighters and individuals to protect buildings as in 1983.
- The lessons of 1926, 1939, 1944, 1965, 1983 and now 2003 do not appear to have been learnt.
- Skill levels in the agencies have been seriously reduced by economic irrationally driven staff reductions. (see Cheney ANU Fire Forum).
- Legal processes, spin and personal attacks are used to obscure and hide facts and protect departments – note for example the use of massive legal forces by DSE and CFA to prevent the issues in my report to the Linton Inquest from being aired.
- The bureaucracy has subverted the Westminster process by setting fire and fuel policy and then snowing the political arm of government. The agencies should instead provide honest alternative advice to the Government who acting in the State interest, will set the policy for the Agencies to carry out. An old fashioned view perhaps but better than the alternative.

Despite my better judgement I am prepared to support the above assertions, facts and opinions in person and no doubt yet again withstand the slings and arrows of official outrage. In the meantime if this inquiry is really interested in understanding the nature of the problem it should consider and take into account the Stretton Royal Commission, The Cheney ANU paper and my report to the Coroner in the Linton Deaths (how you get it is your problem as CFA and DSE continue to ensure that it is legally suppressed)

I do not have confidence in this Inquiry as it is clearly not open and independent. The lack of judicial powers to compel evidence and have it on oath will ensure that the unpalatable truths remain hidden.

25 May 2007

**Supplementary submission to**

**Victorian Bushfire Inquiry**

**David Packham**

**1 June 2003**

This supplementary submission has been hastily prepared at the request of the Inquiry Chairman to assist with further input to my submission of 9 May 2003.

I would have preferred to have prepared a submission that was more considered, more researched, addressed more aspects of the fire problem and been more polished in its presentation. I apologise for the shortcomings that I am aware of and for those that have escaped my attention. My only excuse is that I am with out any time or resources and as such this is the best that I can afford.

The bushfire problem that we have inherited and have created by forcing a Eurocentric view of fire on the Australian landscape is simple in principle but very difficult and complex in detail. The difficulties have been generated by changing totally the role of fire in maintaining a healthy and safe environment. The indigenous people aided by lightning ensured that frequent mild fires punctuated by areas of high intensity fire burnt throughout most of the year including and especially the summer and autumn in Victoria. The resulting landscape was one of diversity, low average fuels and considerable native animal grazing. "We have stuffed it". The solution is to return fire to this environment.

Such a return of fire is as difficult as any other problem facing the environment such as salination, loss of natural landscape due to development and environmental flows in our rivers. The changes have not only been the removal of the pre-European fire regime but the insertion of blackberries, foxes, rabbits and vulnerable and badly designed human assets. The reversal of this damage is not easy and perhaps impossible due to a lack of political will and the personal agendas of some in our agencies of government.

The laws of thermodynamics know nothing of these difficulties and just ensure that if there is fuel it will burn sooner or later. If there is less fire there will be more fuel and a hotter, faster and damaging fire. The decision not to burn is in reality a decision to burn much less but much hotter. Rather than reiterate this historical analysis I refer the inquiry to Tim Flannery's book "the future eaters" and Tom Griffiths "Forests of Ash".

There is a lot of information around in the scientific literature. McArthur and Luke, "Bushfires in Australia" at least 300 pages, "Fire in the Australian Biota" which must be another 300+ pages, an American text of two volumes, a decade of the International Journal of Wildland Fire would cover a lot of what is relevant here. In this submission I cannot cover more than a monolayer of the knowledge available.



Many aspects of my suppressed report to the coroner on the Linton Inquest are relevant to recommending a better approach to the Victorian fire threat. The report is not available so to support this short contribution I have included some appendices to that report all which are in the public domain. The appendices can be found in the CD of the Coroners report at PACKATT1, PACKATT2 and PACKATT3. The contents of these files and page numbers are attached to this submission. I have reproduced three of these attachments and included them with this submission.

Sadly, the attitudes reported by Stretton in his royal commission seem to be still in place amongst some of the public servants within the relevant departments if one is to believe the anecdotal reports and submissions of outraged and shocked locals. I am sure that there are such elements in existence and am also sure that there are many within who are of the highest calibre and dedication and I hope that they get their say as well. Whenever I feel any oncoming delusions I reread page 7 from the Stretton Royal Commission... (included with this submission) and come firmly back to land.

### The Risk

The major risk to Victoria from bushfires has been the failure of the responsible authorities and the urban public to understand the scale of the bushfire threat. Even now that is not fully recognised except for those who have seen or experienced the recent fire disaster and was aptly described with a voice of awe by the Inquiry Chairman as "inhuman". This understanding gained either by seeing the aftermath or living through it or internalising the boffin figures and calculations is a necessary first step to providing solutions. In July 2002 I wrote the enclosed letter to the weekly times a section of which was published in the Sun. I received no feed back or comment from the authorities or for that matter from anybody else. I sand b y the content of that letter and suspect that on The 31 July next if no good rains fall I could send it of again with 2002 changed to 2003. The drought and fuel dryness is still with us. There is more moisture up north, which could save the bacon somewhat. The full text is attached.

In the absence of a drought break the State faces a threat greater from fires than internist activities. Unless of course the external threats realise how vulnerable we are and take advantage during the next summer.

### The scale of large fires.

The 1.3m ha just burnt probably had 30 tonne per hectare of available fuel, that is about 40 million tonnes of fine fuels were consumed in the flame fronts (and at least the same amount of heavy fuels later). That is an energy release equal to almost 3000 Hiroshima fission bombs. Just about enough to destroy every large city in the world.

The average fire intensity spread over about 10 hours of fire spread per day with a spread rate of about 3 kilometres per hour is 14 mega watts per metre. Peaks of fire spread as it ran up slopes and troughs as in burnt down hill would be around 60 and 4 Mw per m. All



of which will overwhelm a any firefighter or aircraft with can cope with a maximum of 2 Mw per m.

A few more helicopters will have little impact once the first few minutes of acceleration have occurred.

The conclusions are obvious and inescapable and based upon physics, thermodynamics and the laws of chemistry. Control of the fuel is the only effective strategy. The use of fire for fuel management has been well stated by Robinson et al ("Cleaning up the Country", attached) and also by the head of the US forest Service, Jack Thomas (Concerning the Health and Productivity of the Fire-Adapted Forests of the Western United States, attached).

The quasi scientific argument is based upon Byram's line fire intensity index (not an index at all but a rigorously derived physical parameter)  $I = H w r$ , where I is the fire intensity, Mega watts per meter of fire edge, H the calorific value of the fuel (usually about 17 Megajoules per kilogram) w the fuel concentration (Kg per square meter) and r the rate of spread (meters per second). There is also a relationship between the r and w which can reduce the equation to I is proportional to the square of the fuel concentration. Hence reducing the fuel by one quarter reduces the fire intensity to one sixteenth. The lower rate of spread also decreases the area burnt by between one quarter and one sixteenth depending on wind speed.

This is just not boffin talk but the realities of the physical world. Natural fuels will burn if weather and ignitions coincide. The heat stored in the fuels will be released and often at a rate that is beyond human control. The resulting fires will have a mass of undesirable results. The areas burnt in 2003 will be a fuel management problem for 15-20 years.

Experiments in Nowa-Nowa during the 1980's showed that the maximum fire intensity that could be controlled at the head is 2.5 Mega watt per meter. Fuel reduction limits at about 0.5 Mw per m, crowning fires start at about 10 Mw per m, the Linton tanker was over run by a fire of about 10 – 12 Mw per m and Ash Wednesday in Victoria averaged about 50 – 70 Mw per m.

The conclusion again is inescapable that the only way that control can be achieved is by fuel management.

#### Fuel reduction

Fuel reduction by burning can generate a "fire proof" dry forest. The West Australian experience was that a 4 – 5 year rotation which took a decade to achieve after we introduced it created a very safe and healthy environment. A ten-year rotation is the longest that can achieve any protection.

It is unfortunate that the evidence for the above assertions is sketchy and lacks a proper review. A review at a rigorous and objective level will give more objective advice for the

future. In the meantime a start by aerial ignition could achieve a useful level of protection especially for our water supplies if next summer is bad as the last.

An expert advisory and auditing team is required to ensure that the burning actually takes place. There are many excuses for not burning (see Cheney, attached) and whilst safety is important the operational activity to achieve responsible fuel loads will occasionally involve escapes (see Thomas conclusions, attached and emails from Florida and Tasmania, attached). The greater irresponsibility is to maintain our current catastrophic fuel levels.

### Community Involvement

A fire even on a bad day will begin and remain below the 2.5 Mw per m level for some time. It may take 5 or 10 minutes to exceed the control level. In that time fast community based initial attack can provide predictable success. The probability of successful initial attack can be calculated (Tolhurst) and it is clear that community based fire brigades are an important first line defence. Their success is greatly increased with fuel management especially on extreme days. Issues of fire behaviour are relevant here and the application of the McArthur models of fire behaviour is all that is needed to prove this assertion.

The current destruction of community fire brigades by centralising control, devaluing local experience and skills will in the next decade reduce this capability.

A level of safety is required for community firefighters and the current situation on the CFA fire tankers where plastic is used for heat shields and water tanks is likely to lead to further deaths as experienced at Linton. The current tankers in the CFA are unsafe for this reason and to not fix the problem is to invite accusations of deliberate negligence. They must be grounded until metal heat shields are fitted.

### Research

Fire research is the basis for successful fuel and fire management as well as professional and public education. Fire research can have an applied, coal face component more akin sometimes to development. Fire research can also have a far-reaching and sometimes uncomfortable component. It is the later that has been suppressed in Australia over the last twenty years and has seen us left well behind the world that we once proudly led. It has been suppressed because results can sometimes challenge current policies but it can of course support them.

Independent research needs to be supported. It does not need to be co-ordinated (read "controlled" for that is what the co-ordinators have in mind).

The proposed CRC will if it survives will produce only "correct" results under strict supervision by the strongly directive board.

National consensus and guidance needs to come from many sources to be creditable. Without creditability fuel management will not be achieved.

How to develop a healthy research environment.

Have a research fund in Emergency Services with an independent and representative committee to oversee grants for projects in Universities and the community. Host conferences open at all. Fund visiting guests both internationally and locally. A million dollars will achieve a lot.

There will have to be a balance to the agency controlled CRC.

#### Fire Control

I am concerned with the replacement of local experienced fire controllers by the incident management system. Let not my critics say that I do not understand it for I do. Because I understand it is the reason for not liking it. My examination of Linton caused me to conclude that the IMS may be suitable for a professional agency with a slowly developing situation but for a rapidly moving fire it failed and will continue to fail. It is slow to establish and takes no account of how a community actually works, a little time spent with some good anthropologists and social psychologists would bury it quickly. It fails to take account of local knowledge, relationships, trust and most importantly networks. It has no place in a community based fast initial attack fire brigade service. Its failure in Linton in my opinion was a major contribution to the placing of firefighters in harms way.

#### Conclusion

Fuel management has a sound basis within the physics of fire behaviour. Fuel management is an effective and sole strategy that can remove the extreme threat to Victoria, its residents and infrastructure. An immediate program may avert a similar disaster to 2003. Before next season with aggressive and experienced management, government and public support and the use of resources from around the nation a program of 300,000 hectares (probably 5-10% of the dry forests) that may protect our wetter and more sensitive forests, catchments and interfaces. Some reference and other special areas would need to be excluded from the program.


Independent research needs to be supported and encouraged.

An immediate return to local and community based fire protection by volunteers is essential if community support is to continue.

The dangerous fire trucks must have their plastic heat shields replaced before the next fire season.

The Incident management system needs to be scrapped for volunteers and a community acceptable fire management system developed.

The issues raised by Cheney (attached) should be noted and considered.



25 MAY 2007