

## Facing the Bushfires

### A Submission by the National Association of Forest Industries to the House of Representatives **Select Committee** **on the Recent Australian Bushfires**

June 2003

#### SYNOPSIS

*The Select Committee should take full advantage of the important role it has been given.*

*Following the tragic loss of life and the historic destruction of property and environmental reserves that took place during the recent summer, there is a vital need to draw together evidence on the causes and effects of bushfires and provide expert practical solutions on what to do about them.*

*The Committee can deal firmly with many of the policy mistakes that have added to the destruction and loss due to fires.*

*This Submission draws the attention of the Committee to the key issues, and proposes sensible, effective measures to address them so that the Australian environment, and future generations of Australians, can avoid future appalling destruction.*

# Submission to the House of Representatives Select Committee on the Recent Australian Bushfires

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## INTRODUCTION

*"...high frequency fire has recently been nominated as a threatening process under the [Victorian] Flora and Fauna Guarantee Act 1988. ... however, over-burning is not occurring at either a Statewide or at a bioregional scale. ...*

*...the threat which fire frequency poses to species composition and community conservation in Victoria is in fact from under-exposure to fire. Fire frequency is too low across the landscape.*

*Neither frequent fire nor the absence of fire are desirable; rather a diversity of fire regimes (of varying intensities, scales, seasons and fire intervals) is needed to maintain the biodiversity of these communities. The continued survival of these vegetation communities on a broad scale will rely on the active management of fire across the landscape.*

*While at a single location fire may occur in a vegetation type too frequently, the overwhelming proportion of [vegetation types] with age class distributions far from their 'ideal' clearly indicates that there is a need to promote and target the active use of fire as a tool for ecological management..."<sup>1</sup>*

The conclusions cited above were made by a scientific panel advising the Victorian Government's land management authorities in March 2002. They underline the fact that our natural environment, as much as our social and economic interests, needs an urgent and dramatic improvement in fire management practices.

The Select Committee will no doubt receive many submissions outlining the great damage caused by bushfires in the spring and summer of 2002. It was without doubt the worst season on record for landscape devastation by fire, with well over 3 million hectares lost.

Only in regard to the loss of human life do other terrible fire events, such as the 1983 Ash Wednesday fires, exceed this summer's vast social, economic and environmental losses.

The recent bushfires should be a turning point in landscape management for environmental purposes. Vast areas of land that were reserved for the protection of ecosystems have been destroyed.

Previous policies covering the role of fire in environmental protection must now be comprehensively revised. The case for no-fire or minimal-fire approaches to forest management has been discredited. Half-measures and inconclusive answers are no longer acceptable.

The Committee must resist pressure to allow the current land management regimes to continue.

The Select Committee will hear from urban environment groups that scientific fire management is "not the answer", and that a formless enemy termed "climate change" is to blame.

In considering these claims the Committee should be watchful for false arguments as much as for weak evidence. If there is indeed a real climatic change that adds to the future risk of fires, then the case for correct fire management is made all the more forceful.

Australia's forest industries are relevant to the Select Committee's mission in three ways.

Firstly, as part of the wider community of forest professionals, we are appalled at the unscientific and ineffective techniques used in the stewardship of large areas of public forest in Australia.

Secondly, despite great success in minimising fires within well-managed forests (those managed by private owners and the State forestry agencies), these forests and their future productivity are at great risk from neighbouring areas where fire risk management is failing.

Thirdly, the workers and local communities who form the forest industry have historically played

a crucial role in the protection of public forests and the towns and farms adjacent to them. Major changes forced on the industry in recent years through policy decisions – most notably the deliberate removal across Australia of many local forest industries and businesses – have dramatically reduced the expertise, experience, infrastructure and labour available for forest fire management and fire fighting.

If the Select Committee examines the evidence closely it will see that a false conflict has been created between scientific forest management and the needs of the environment. In fact, it is our natural environment that is most in need of more scientific approaches to the management of fire risk.

Although sustainable forest management for productive purposes requires some interventions that are not necessary for environmental protection, there are many basic management principles that should be applied to all forests. The sound management of fire – not the artificial (and unachievable) aim of the *exclusion* of fire – is one such principle. Forest management for true healthy biodiversity – as opposed to the illusion of protecting ‘nature’ through ‘non-interference’ – is another.

These debates have reached a profound turning point. Many environment groups are unable to build alliances with scientific knowledge because to do so would require them to discard many of their ideological positions – such as non-interference in ‘nature’ as they understand it, antipathy to economic activity, and rejection of the economic needs of established local communities.

This Submission also draws the attention of the Select Committee to certain future problems caused by current policies and by the fires, including the effects of fire on catchment hydrology. A strong period of forest regrowth will make substantial demands on water in fire-affected and downstream regions.

The declining future availability of forestry workers and their expertise in fire management is another emerging issue that adds to the prospect of future uncontrolled fire disasters. The Committee should highlight the connection between the role that these essential human resources play and the future harm that will result from their continued removal.

There is also widespread community concern over the lack of financial resources provided by the States to adequately manage and protect our forest ecosystems.

The Select Committee was charged to “*identify measures that can be implemented*” to address the destruction caused by fires. Based on the expert advice the Committee will hear, your Report can establish enduring benchmarks for fire management policies. Using these benchmarks, the Committee can also help to set in motion a comprehensive review of State fire management policies, funding and administrative arrangements.

Finally, the Select Committee’s Report can provide a solid basis for ongoing assessment of the policies for which governments and their agencies are responsible, and the outcomes they achieve – or fail to.

## **KEY ISSUES**

### ***A Holistic Approach to Managing the Risks of Fire***

The Select Committee will be confronted by an apparently irreconcilable conflict between two ideologies. Land users and managers will describe the dangers from bushfire and the ways it can be fought, and express their despair that many of the known precautions and reactions are being suppressed by policy failures. In opposition to this experience, the ideological element of the environmental movement will tell the Committee to ignore land managers and continue to avoid

any forest management actions which can be accused of any form of short-term or immediate environmental 'damage'.

This dichotomy has proved disastrous for Australia's landscape, with our environmental reserves suffering the greatest damage of all.

The 'green' policies towards fire, which now heavily influence the policy settings in most States, have committed the classic logical error of attending to small immediate risks at the expense of ignoring less apparent but far greater long-term risks. The evidence is overwhelming that in achieving primary environmental objectives such as the maintenance of biodiversity and the long-term protection of ecosystems for future generations, the policies of recent years have failed.

However, the Committee should be aware that when fully understood, there is far less conflict between sound fire management policies and environmental objectives than the 'green' group would have us believe. In fact, sound fire management policies are an essential part of protecting the environment.

The 2002-03 bushfires have graphically demonstrated the environmental consequences of not carrying out sound fire management.

Fire management also links directly to the management of water in the landscape, by affecting both runoff and water consumption rates by vegetation.

Fires destroy extensive amounts of property, and require significant economic resources to fight and to clean up after. They can also cause significant setbacks in regional economic activity. These economic costs must be kept in mind as State Governments try to minimise their expenditure on fire prevention and containment activities. Short-term government expenditure constraint can lead to higher long-term public costs overall).

The Select Committee should consider supporting a holistic policy approach to fire issues, which values the longer-term benefits to environmental protection that sound fire management practices can bring.

The Select Committee should consider concluding that current policies have now been shown to be a danger to the natural environment.

**Recommendation 1.** The Committee should clearly state that the primary risk management objective in regard to fire for all land-use types is the avoidance of major, high-destruction conflagrations.

**Recommendation 2.** The Committee should conclude that no land-use policy which fails to address this primary objective should be regarded as adequate.

**Recommendation 3.** The Committee should conclude that many current land-use policies fail to achieve the primary risk management objective.

### ***The Measures Needed to Minimize the Impact of Fire***

The Committee will have received extensive expert advice on the policies that can be applied to minimise the impact of fires. Some of the key measures include:

- Adequately funded and realistic hazard reduction strategies, primarily (but not exclusively) a mosaic pattern of fuel reduction burning;
- Deliberate fuel removal programs, such as thinning operations or biomass fuel collection. (These activities also create economic value);
- Maintenance of an adequate professional and volunteer fire fighting force, including local forest

industry personnel;

- Adequately funded fire detection systems;
- Maintenance of access trail systems to facilitate rapid reactions to new fires;
- Well-managed rapid reaction suppression forces; and
- Fire-issue education of landowners in fire-vulnerable areas, and maintenance of adequate emergency civil communications systems.

**Recommendation 4. The Committee should produce a comprehensive statement of these fire management practices which support achieving the primary risk management objective of avoiding major fire events.**

### ***Integration of Fire Management Service Providers***

It has been clear for many years that at the State and local level there are conflicting policies and practices between a range of authorities. In times of crisis, these conflicts can cripple effective responses and lead to increased fire scale and increased impact from fires.

The range of policy platforms between public and private resource-using land managers, local governments, government conservation agencies, fire authorities, and volunteer organisations is simply too diverse and too contradictory.

The Select Committee should examine the evidence of the Victorian Association of Forest Industries, which has gathered information on instances of direct conflict between State agencies at vital moments in the battle against the Alpine fires.

There are also a number of direct regulatory impediments to sound fire management. These are usually related to 'conservation' policy arrangements such as the cessation of road maintenance, rejection of fuel removal or reduction activities, rejection of emergency earthworks and backburning operations, and similar positions. During the Victorian fires there were reported instances of actual obstruction of the activities of firefighters by officials purporting to implement such regulations.

All such regulations should be reviewed for compliance with identified fire management principles. Even where policies are exempted from meeting sound fire management principles for some other reason (whether wise or not), emergency overriding arrangements should be in place in advance of crisis events.

The Committee should examine the levels of funding provided to fire management and control agencies by the State governments. Lack of funding has frequently been cited as a reason for inadequate ability to prepare for, or react to, fires. It is poor risk management for State Governments to actually contribute to disaster events which strain State treasuries and destroy economic assets and productivity in the name of short-term budgetary savings.

The Committee should attempt to define acceptable levels of State Government funding to agencies and local government authorities for the purposes of fire management and fire reaction.

A lateral solution to many of these problems would be to create single service providers for fire management and control in each State. Such a fire management agency could develop policies directly from the available scientific knowledge bases (including CSIRO and the new Bushfire Co-operative Research Centre), and then provide services to all public and private land managers and local authorities through service-level agreements and related funding mechanisms.

Establishing a unified fire management agency would also end the inconclusive blame-shifting exercises that follow major fire events. In fact, such a provider would be more effectively accountable to Government and the public for overall outcomes. The performance of such an agency could be

measured against a known set of performance criteria.

In addition, assessing the funding effort made by State Governments would be much more transparent if the States adopted single service providers.

Finally, many of the necessary practices will require extensive involvement by private landowners and businesses. An intelligent means of overcoming funding problems whilst simultaneously pursuing environmental objectives would be to use 'stewardship contracts', under which contractors were engaged to achieve specified environmental, land management and fire risk management ends, funded at least in part from revenue sources derived from the removed forest fuel material.

- Recommendation 5.** All relevant regulations should be reviewed for compliance with identified fire management principles. Even where non-compliant policies are exempted from compliance with sound fire management principles for some unrelated policy reason, emergency over-riding arrangements should be in place in advance of crisis events.
- Recommendation 6.** The Committee should examine the levels of funding provided to agencies with fire management and control responsibilities.
- Recommendation 7.** The Committee should attempt to define acceptable levels of State Government funding to agencies and local government authorities for the purposes of fire risk management and fire reaction.
- Recommendation 8.** The Committee should consider recommending that States establish single service providers for fire management and fire control. Such a service provider could provide services to all land managers and local authorities through service-level agreements and related funding mechanisms.
- Recommendation 9.** The Committee should support the use of 'stewardship contracts' under which contractors undertook to achieve specified environmental, land management and fire risk management ends, funded in part from revenue sources derived from the removed forest fuel material.

### ***Measuring Government Performance***

The variety of conflicting policies on fire management must be brought under control. It is quite clear that while this policy situation continues, there will be little hope for improving the outcomes of fire management.

- Recommendation 10.** The Committee should lay down criteria for assessing policy regimes in the States, and then attempt at least a preliminary assessment of each State for compliance with those criteria.
- Recommendation 11.** Ongoing compliance assessment should be referred to an appropriate Commonwealth agency.
- Recommendation 12.** These criteria should address basic policy principles, the content of regulatory regimes, the degree of integration (or conflict) between state agencies, and State Government funding efforts in regard to fire risk management.

### ***Living in Fire-prone Landscapes***

Finally, the Committee should be wary to avoid being drawn into the practice of blaming local residents for their vulnerability to fire. Similarly, the Select Committee should be aware that timber construction is not in itself a cause of fires. Almost all buildings destroyed by fire are actually burnt from within after embers are allowed to enter due to avoidable failings in building design and maintenance. There is certainly no justification for the reduction in the use of timber – the most environmentally sustainable of all construction materials – in bushfire areas.

**Recommendation 13. The Committee should not support false arguments that timber as a building material is a cause of fire vulnerability in buildings.**



## ATTACHMENT - SPECIFIC RESPONSES TO THE TERMS OF REFERENCE

### *Introduction*

Regrettably, the majority of public debate (especially the demands of the more radical environment organisations) about the state of our environment leads policy-makers towards a dangerously simplistic approach to ecosystem management

This false vision suggests that if we simply eliminate human activity, especially commercial activity, and avoid any active management, “nature” will look after itself.

Unfortunately these management practices, which purport to protect ecosystems, can result in an undesirably high fire hazard, particularly in Australian forest environments that have evolved in the presence of fire.

Bushfires will always be a major disturbance to the Australian environment. Bushfires once functioned as a natural process to thin forests, consuming excess vegetative fuel and enhance diversity. However, there is now ample evidence that many forests are choked with excessive dry vegetation, as vegetation growth has not been interspersed by the periodic, low intensity bushfires that plant communities evolved with. In fact, in many areas natural fire has been artificially excluded.<sup>2</sup>

With the increasing declaration of national parks, the inflexible approach that comes with creating parks removes or constrains tree thinning that is vital for biodiversity. The recent devastating bushfires indicate that decades of fire suppression has left a dangerous amount of fuel in the forests.

Fires do not respect invisible boundaries between land uses. Their severity and impact on the natural environment and on human activity can be strongly influenced by the fire management regimes adopted by the different management agencies. Reducing fire effects through good fire prevention is far more desirable than slow landscape rehabilitation.<sup>3</sup>

CSIRO fire scientist Phil Cheney argues that a gradual transfer of responsibility from land managers to fire fighters has led to a shift from *prevention* to *suppression*. Cheney suggests the intensity of the 2003 fires are due to a continuing decline in operational prescribed burning over the last thirty years.<sup>4</sup> This is supported by the *Australian Terrestrial Biodiversity Assessment 2002* that reported that one of the most widespread processes threatening ecosystems is altered fire regimes.<sup>5</sup>

Regrettably, the increasing influence of environmental lobby groups has led to an increase in conservation regulations and practices that impede efficient fire fighting efforts to the detriment of forest values and personnel safety.<sup>6</sup> Fire preparation and prevention measures are decreasing and will do so more rapidly as new areas of native forest are transferred from management by foresters to management by national park agencies.

When an area previously classified as State forest is designated as a park, activities related to timber harvesting - such as fuel reduction burns and road maintenance – usually cease. This means that access road networks (sometimes amounting to many thousands of kilometers) previously financed by revenues from timber production become a burden on the public treasuries, and funding thereafter inevitably declines. In many cases the maintenance of these roads is also terminated for deliberate policy choices, such as (ill-considered) short-term conservation objectives.

There is now also a serious loss of experienced fire fighting personnel and equipment due to the transfer from forest management by foresters to management by national park agencies. This loss of experienced staff cannot simply be replaced with casual summer fire fighters and contracted machinery – even if these are available - as the critical bush and fire fighting experience components are often missing.

The deficit in experienced fire fighting personnel compounds when it also reduces local capacities to undertake prescribed burning. The key requirements for carrying out prescribed burning are skill, knowledge and equipment resources. Maintaining ecologically sustainable fire regimes requires both a high level of skill in lighting and controlling the fires, and a high level of knowledge and understanding in where and when to light these prescribed fires in the landscape. Adequate equipment is also essential to achieve the extent of burning required. The forest management downsizing of recent decades has also resulted in bulldozers and transport machinery that aids in fire mitigation and suppression being sold off.<sup>7</sup>

It must be emphasised that the aims of prescribed burning are to reduce the quantity and alter the structure of fine fuels in bushland, so that the *intensity* of subsequent unplanned fires is moderated to a level where suppression is effective.<sup>8</sup> As prescribed burning has unfortunately become a controversial issue, alternative measures both in mitigation and operational response also need to be addressed.<sup>9</sup>

Forest management must be *active* in its efforts to maintain healthy ecosystems.<sup>10</sup> Forests can be managed for a variety of reasons that are compatible - including recreation, watershed protection, wood production and biodiversity – combining to enhance the health and productivity of the forest. To manage catastrophic bushfires, their causes must be addressed by reducing fuel hazards and returning the forests to healthy conditions. Tree thinning and removal of dense undergrowth followed by prescribed burning can ensure thriving forests while reducing risks of catastrophic fires and the destruction they cause.

The catastrophic bushfires in January 2003 are unacceptable both in ecological terms (serious losses of wildlife and biodiversity) and social terms (loss of life and property). The lack of active forest management has resulted in the bushfires burning at significantly higher temperatures than normal fires, and causing longer-term and more severe environmental damage.<sup>11</sup>

Flow regimes of streams have been changed as a result of the recent bushfires. In the short term, water-yields (also referred to as catchment runoff or streamflow) are increasing. In contrast, over the long term, when the forest is rapidly regenerating, there will be significantly lower streamflows. Furthermore, water quality has decreased with large quantities of coarse sediments moving into streams, filling waterholes and altering the streambed character.<sup>12</sup>

Carrying out active forest management can lessen the long-term effect of rapidly regenerating forests that will lower streamflows following the recent bushfires. Studies show that forest thinning for desired conditions protects watersheds and even increases water yield and quantity by artificially reducing vegetation density.<sup>13</sup> If yields diminish during the regrowth phases following bushfires, appropriate and well planned management of forest thinning via selective logging will be imperative to ensure farmers have an adequate future water resource.<sup>14</sup>

Fire has greatly influenced the formation of ecosystems, and continues to be an important factor in the development and maintenance of many forests in Australia. The technology is now available to manage fire in a way that maintains biodiversity and markedly reduces the hazard to human life and assets. The barriers to the implementation of the technology is the provision of sufficient funding for fire management and the removal of the policy and ideological barriers.<sup>15</sup>

Government support must be increased for fire management programs so that less needs to be spent on bushfire emergency and disaster relief, and more on long-term sustainable fire management.<sup>16</sup>

### ***General Mission of the Select Committee***

***The Committee aims to "...identify measures that can be implemented by governments, industry and the community to minimise the incidence of, and impact of bushfires on, life, property and the environment..."***

The motion appointing the Select Committee emphasized that the core mission of the Committee

is to “*identify measures*” to change the situation faced by forest regions and their neighbours. The documentation of an authoritative list of sound fire risk management practices is the first and most fundamental role of the Select Committee.

### ***Term of Reference (a)***

***“the extent and impact of the bushfires on the environment, private and public assets and local communities;”***

#### *The Extent of the Recent Bushfires*

The enormous loss of environmental and economic resources during the 2002/03 bushfire season has set a new and disastrous record for land and environment destruction. It was, according to Australia’s foremost fire researcher, “*a truly historic event [producing] probably the most extreme, widespread and continuously burnt area in living history.*”<sup>17</sup>

The fire season actually commenced as early as August 2002, with significant fires in north east NSW. Over one hundred fires eventually struck NSW, the ACT and Victoria, the majority of them in national parks. Queensland, Tasmania and Western Australia also suffered significant fire seasons.

#### **Area burnt across Australia during the 2002-03 bushfire season (estimate to February 2003):**

NSW and the ACT	1,595,000 ha
Victoria	1,324,000 ha
Queensland	115,000 ha
Tasmania	41,000 ha
Western Australia	31,000 ha
Total	3,106,000 ha

#### *Impact on reserve forests and biodiversity*

The effect of major fires on biodiversity and ecosystems is dramatic. Parts of the landscape affected by the recent fires have been virtually sterilized, and it may be some time before new ecosystems can become established.

The intensity of a fire is highly relevant to its ecological destructiveness. Professor Rob Whelan, University of Wollongong advised the NSW Parliamentary Committee in 2002 that “*a single high-intensity fire certainly causes greater mortality of animals than a single low-intensity fire*”.

It is for this reason that moderate mosaic-pattern hazard reduction burning actually increases the overall preservation of the environment.

Microcosm reserves such as Tidbinbilla Nature Reserve, south of Canberra, were completely wiped out. There is very strong evidence that the application of sound fire management practices to the surrounding forestland would have saved this reserve.

#### *Impact on greenhouse gases*

The 2002-03 bushfires emitted historic levels of carbon dioxide – the most common greenhouse gas. Early estimates of the emissions were around 120-130 megatonnes – equivalent to over 20% of Australia’s total annual emissions of 530 megatonnes. This carbon dioxide output is larger than the annual output from any emission cause except electricity generation, which generates approximately 160 megatonnes of emissions annually.

The immediate release of carbon dioxide is the major greenhouse consequence of fires, but there are also ongoing effects.

The fires cause a direct loss of living trees. Where these trees are of young to mature age, this loss reduces the carbon intake by the forests. This effect does not occur for senescent (old-growth) individual trees, which have slowed their carbon intake and may actually be releasing carbon through progressive decomposition.

On the other hand, if a forest of older age is cleared by fire and a new forest regenerates in its place, in due course the vibrant young forest will sequester a greater intake of carbon dioxide than was the previous senescent forest.

#### *Impact on water consumption*

In the months after the fires, the burnt catchments have become wetter than unburned forested catchments, and this will continue until a full tree canopy redevelops. Burnt catchments produce significantly larger dry-weather flows and flood peaks, and continue to do so until vegetation re-establishes to attain total leaf areas similar to the unburned forest.<sup>18</sup>

The vigorous vegetation regrowth that will develop in the wake of the fires will increase natural water consumption in the Murray Darling Basin's rivers for up to 100 years. This will have an immense impact on irrigation-reliant industries and all other water resource users. The issue is crucial to the future of the Murray Darling Basin as the heavily burnt Kiewa, Upper Murray and Ovens catchments provide 38% of the basin's water. More than 706,000ha were burnt out in north-east catchments, plus another 400,000ha in East Gippsland. In addition, 460,000ha was burnt in the Kosciuszko National Park, affecting the Murray and Murrumbidgee catchments.

CRC for Catchment Hydrology Director Rob Vertessy believes that forests of alpine (mountain) ash - a very fire sensitive species - contribute an excessively high proportion of rainfall run-off in the above mentioned catchments. Taking into account the large amount of ash forest destroyed in northern Victoria - about 40,000ha - the catchments will be seriously affected.<sup>19</sup>

The CRC for Catchment Hydrology has developed a catchment model showing rainfall run-off gradually falling to half the annual average after 25-30 years in burnt mountain ash regrowth forests, before entering a recovery phase taking up to 80 years.<sup>20</sup>

Bushfires also lead to conditions of increased soil washoff, soil slumping and streambank collapse in the period shortly after fire. Soil has been altered and destabilized on the hillslopes by intense heat and the loss of plant roots during the fires, and thunderstorms since have washed it into rivers. This has been observed in the Ovens River that flows from the high country to the Murray River after heavy rains, where ash and mud have continued to clog up the river since the fires. It could be three to five years before the river fully recovered.<sup>21</sup>

Burnt catchments will also result in fish death due to lack of oxygen in the water, organic matter washed into the streams, and, increased water temperatures.

#### *Impact on the forestry industry*

The forest industry suffers a number of losses from bushfires.

Firstly, the industry will lose tree stock. Production forest assets in private hands as well as those in public hands (State forestry agencies) are traditionally much better managed for fire protection than unmanaged forests (including national parks). For this reason, there is usually much lower loss of forest in these areas. However during major fires, even well-managed forests are at risk. Large areas of production forest were lost in Victoria in 2002-03, especially in Ash forests which are easily killed by fires.

The threat to production forests from fires also creates a direct increase in insurance costs to the industry.

The industry loses considerable labour force effort during fire emergencies, as forestry workers

volunteer for fire fighting roles.

Following major fires there may be opportunities for the timber supply to be supplemented by salvage timbers. However there are currently in force needless State policy limitations on salvage operations. In Victoria, the State Government has prevented salvage operations in native forests. There is no environmental advantage at all in such a decision, which appears to be little more than an extension of the antipathy felt by radical environment groups to native forestry. There is also a great irony in the situation, as the major part of Victoria's ash forests were replanted in their current form following salvage harvesting after the fires of 1939.

### ***Term of Reference (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;”***

#### *Causes – natural and human*

The major causes of fires are not in doubt. Lightning strikes in remote areas ignite the most difficult and often the most destructive fires. Arson is also a factor in fires closer to settled areas.

Both these causes will continue. Education and social forces may have some prospect of reducing arson, but the natural ignitions will certainly remain.

The evidence surrounding the 2002-03 Alpine-Kosciuszko fires is that they were ignited by lightning.

The related cause of *major* fires in wild areas is the accumulation of fuel, which allows a lightning-caused fire to grow from a small event into a large one.

Climatic conditions provide the final causal factor in fire events. Very hot, dry seasons prepare the fuel to be combustible. Hot strong winds provide the impetus for the rapid growth and spread of conflagrations.

The arguments raised by some 'green' commentators that climate change induced by human activities has exacerbated these climatic conditions may hold some degree of truth. However, to the extent that these arguments are correct they only *reinforce* the need for strong fire management policies.

The scientific debate around climate change would suggest that there is not likely to be any reversal of the estimated human-caused effects except in the very long term. Meanwhile, there is also some evidence that a natural, cyclical process of global warming is taking place.

The proposition that policy initiatives that will make only modest impact on climate change – such as Australia acceding to the Kyoto Protocol – should be adopted as the sole policy response, to the exclusion of sound fire management practices, is clearly a totally inadequate approach.

In any event, the Australian position of allowing emissions to grow to 108% of 1990 levels cannot be said to represent any improvement in the fire hazard conditions which applied during the 2002-03 fires.

#### *Risk factor: failure to apply fuel hazard reduction*

Fire is still one of the most important management tools used in forestry today. Forest managers undertake programs of regeneration burning and fuel reduction burning to promote the growth and

health of forests and manage the environment effectively.<sup>22</sup>

It is well recognised that fuel is the only element of a forest environment that can be controlled to lessen the intensity of bushfires. A decrease in forest fuels reduces the build-up of flammable material so that when bushfires do occur they are at a much lower intensity. If there is no action to control this fuel, it will continue to build up and create ideal conditions for uncontrollable bushfires.<sup>23</sup>

Prescribed burning makes suppression more efficient because it:

- reduces fuel loads and simplifies fuel structure;
- reduces flame heights, intensity and rate of spread;
- reduces density of firebrands and the distance they are thrown.

It is necessary to recognise that hazard reduction does not *prevent* fires – rather, it assists in preventing *unmanageable* fires. The effectiveness of hazard reduction burning depends on fuel type and growth rates in specific locations. However, CSIRO scientist Dr Phil Cheney (2003) believes that controlling ground fuel quantity with regular, cool, controlled burns will usually cause a fire in eucalypt forest to peter out.<sup>24</sup>

Estimates show that if the quantity of forest litter is allowed to double, the potential damage caused by a bushfire increases by a factor of 16.<sup>25</sup>

To be effective, fuel reduction burns need to occur at regular intervals.

The Select Committee should play close attention to the concept of a ‘mosaic’ pattern of fuel reduction burning. Such an approach aims to create diverse patterns of fuel load which lead to different landscape reactions to fire. In this way major intense conflagrations are prevented or at least inhibited.

Scientific forest fire risk management does not call for universal burning, nor does it require rapidly repeated burning.

Forest harvesting and hazard reduction burning in State forests and protected areas generally aims to generate a mosaic with varying humidity, canopy heights and fuel loads that may include burnt and unburnt blocks. This significantly aids bushfire control and also assists in achieving ecological objectives. Blocks are burnt on a rotational bases at a frequency that is appropriate to the value at risk (e.g. life, capital investments, community assets, and environmental values).<sup>26</sup>

Fuel reduction burning is generally carried out after the summer drought has broken and under prescribed weather conditions. Such burns are much less intensive than wild bushfires can be. Just as importantly, the burning occurs after the period when thunderstorms are most likely. In southern Australia, thunderstorms occur most frequently in summer and early autumn, so it is probable that for some streams massive quantities of ash, charcoal, nutrients and sediment will be washed into streams during the very early months of the year. These materials can more readily enter streams if the streamside ‘buffer’ vegetation has been destroyed.

For example, thunderstorms in Melbourne (and many other parts of Victoria) are more frequent during the months November-February, whereas fuel reduction burning is generally carried out in March and April. Thus, the probability of fuel-reduced areas being severely eroded is less as a result of lower fire intensity and thunderstorm activity.<sup>27</sup>

The *Australian Terrestrial Biodiversity Assessment 2002* claims that the predominant conservation focus by State Governments has been on national parks that comprise less than 10% of Australia’s land area (approximately 71.5 million hectares)<sup>28</sup>. This is said to have left more than 90% of Australian land relatively ‘neglected’. However, as stated elsewhere, many areas of private and public land managed for non-conservation objectives have received better fire management care than environmental reserves.

The management of only about 12% of all conservation reserves was considered by the *Biodiversity*

*Assessment's* authors to be of a "very good" standard, and more than 25% was rated as below the benchmark "good" quality. However, the basis for these ratings does not appear to have included positive acceptance of long-term fire risk management. The assessment indicates that more can be done to improve the management of conservation areas and consequently the state of the environment.<sup>29</sup>

In fact, there appears to be a repeated pattern of fire mismanagement by national parks. Evidence given to the NSW Parliament's inquiry into the 2001 bushfires indicated that in 2000, NSW State Forests conducted hazard reduction burns across 100,000 hectares of the 2.8 million hectares it manages, in contrast to NSW National Parks and Wildlife Service's 19,000 hectares of the 5.3 million hectares it manages. NSW State Forests lost a mere 2,000 hectares by the bushfires in comparison to the 750,000 hectares of NPWS-managed land destroyed.

That is, in the areas supposedly set aside for environmental protection, intense bushfire swept through 375 times the area burnt in State Forests. Yet it is managed forests, not national parks that the conservation movement claims are most at risk of environmental damage.<sup>30</sup>

The effect of fire on individuals and communities is dependent on the fire regime. Different species and communities respond differently to different fire regimes. Consequently, provided that fire managers ensure that the frequency, intensity, and periodicity of fires is varied, it is highly improbable that prescribed burning will endanger species or have an adverse impact on ecological processes.<sup>31</sup>

#### *Risk factor: regulatory impediments*

Even during the 2002 bushfires, participants in the fire effort reported examples of impediments created by regulations and practices focussed on conservation to the exclusion of other considerations – particularly in Victoria.<sup>32</sup>

This avoidable situation means that the regulatory regime is itself one of the risk factors leading to potentially greater fire impacts.

#### *Risk factor: loss of trained and experienced workforce to control fires.*

The number of Victorian departmental personnel with a depth of knowledge and understanding of the bush has fallen dramatically in recent years, since the demise of the Forests Commission in 1984 and the downsizing of the hardwood timber industry in the North East. Prior to 1985 there was

- one District Forester;
- one or more assistant foresters;
- four or more forest overseers; and
- between 6 and 15 permanent crew were attached to eight Forest Districts in the North East (Corryong, Tallagatta, Beechworth, Myrtleford, Bright, Benealla, Mansfield and Alexandra).

These people (over 150 in total) knew their 'patch' well, including areas of national park and other reserves, and were well equipped to handle a fire situation with the assistance of other personnel.

This experience has declined dramatically. There are currently less than 40 experienced departmental forest personnel throughout the North East of Victoria a large proportion now working under the direction of Parks Victoria personnel in a campaign fire situation. The staff and experience deficit has not been made up within National Parks personnel.

The private forest industry also willingly assists with facing the ongoing bushfire threat by supplying bulldozers and transport machinery and operating personnel to suppress fires, particularly in regard to creating instant access for fire crews and constructing fire breaks. These crew provide a valuable resource with considerable local knowledge, experience in using heavy equipment in rugged bush terrain, and experience on fire control with ready availability. Crews are only paid for when deployed, and as such ongoing maintenance and upgrade is not a constant drain on the public purse.

Each forest district in Victoria previously had one or more heavy bulldozers and graders, as well as smaller specialised fire fighting dozers. It is not uncommon for more than half of the machinery in the field in major forest fires to be timber industry machinery operated by timber industry workers. However, all of these larger machines that were well suited to fire combat work have been sold off.

During the fires in January 2003, around 83 industry bulldozers and crews supported the fire fighting effort in Victoria. It is anticipated that almost half of these may 'exit' the industry as part of the industry downsizing that resulted from the review and subsequent reduction of the sustainable timber yield – a decision made by the Victorian Government.<sup>33</sup> This presents a major problem for adequately resourcing future fire fighting efforts.

*Risk factor: lack of Initial attack and access*

Roads permit initial access and attack, and allow early effective action to deal with lightning strikes in remote areas.

However, the fire access road network is extensive and costly to maintain. The planning and management of the network of fire access roads and bridges needs to be conducted within a clearly defined strategic policy framework based on service delivery needs.<sup>34</sup>

During the recent fires, there was an apparent reluctance by firefighters to take early effective action to deal with lightning strikes in remote areas. The lack of access roads may well have been a contributing factor to lack of action.<sup>35</sup>

The reduction in forest access due to the closure or lack of maintenance of roads and tracks, many of which were built by the timber industry at its own cost, is a major concern. This situation has been allowed to develop through both lack of funds for road and track maintenance and 'green' pressure to restrict access to areas that are now parks and reserves. This will inevitably lead to fewer access roads into the forest.<sup>36</sup>

***Term of Reference (c)***

***“the adequacy and economic and environmental impact of hazard reduction and other strategies for bushfire prevention, suppression and control;”***

*NSW - Fire management practices*

The fire management approach in NSW differs sharply between national parks and State Forests. Over the 5-year period leading up to the 2001 fire season, State Forests had conducted burns on 380,000ha and reduced fuels by allowing grazing on 480,000ha of forest, out of a total estate of 2.5m ha. The level of prescribed burning that has been completed by NPWS over this same period is far lower.

Fire management practices adopted by State Forests emphasises reducing intensity, as well as minimising the extent of any high-intensity fires that do occur. A regular program of hazard reduction burning is an integral part of State Forests' fire management regime. This reduces the intensity at which fires burn, minimising the impact on forest values such as soils, fauna, flora, catchment and aesthetics. Hazard reduction burning is practiced as low intensity fire in specifically targeted areas. Areas of high bushfire risk are targeted by careful research and planning, and are carefully controlled and monitored by fire fighting personnel and other fire fighting agencies.

State Forests' fire management policies are as follows:<sup>37</sup>

- Priority is to protect life, property, community assets and forest values and/or achieve economic and ecologically sustained forest management.



- State Forests resources are available for emergency fire management – progressively committed in a measured and cooperative response to the need to protect
- State Forests will control all bushfires on their land which are causing damage and/or have the potential to cause damage – priority is given to control action over all other activities.
- A number of manipulative tools to manage forest fuels are used, including prescribed fire, in accordance with approved Fuel Management Plans. Within management zones special fuel management zones are identified and fire regimes developed.

NSW State Forest fire management strategies include:

- Organisation of State Forests' resources as an efficient and effective fire fighting authority – capable of combating simultaneous campaign fires and integrating with the resources of other fire fighting authorities
- Review fire management plans (at all area levels)
- Periodically analyse records of weather, fuel types and loads, fuel moisture content, fire behavior and fire effects taken during operational burning plans and use such analysis to review burning prescriptions and operational procedures.
- Train all staff for appropriate roles in fire management from base level to Incident Controller of campaign fires. Where appropriate, training programs will be competency based according to Australian Fire Competency Standards and will provide accreditation.
- Maintain a system of roads, fire trails and helipads to provide access and safety for fire fighters
- Operate a fire detection system that gives timely warning of fires threatening the community and/or State forest
- Establish independently, or where appropriate, by cooperation with other fire authorities, an initial attack system that is fast, aggressive and effective with the primary objective of controlling bushfires quickly and with least cost plus loss. When, in accordance with policy, initial attack on a bushfire in State forest is deferred because the fire is not considered to be causing damage or likely to cause damage, the incidence of the fire and the reasons for deferring control action shall be recorded.
- Maintain formal liaison with fire fighting authorities in Queensland, Victoria and the Australian Capital Territory to periodically review operational plans and procedures for the control of fires that cross or may cross State borders
- Translate appropriate research findings into operational practice

The routine use of earth-moving equipment to construct fire-lines for back-burning is another strategy that assists in early containment of bushfires. This practice will result in some soil disturbance. However, it is insignificant compared with the soil loss that can occur, through the agencies of wind and rain, over larger areas that have been subjected to intense bushfires. The area of fire break and fire trail construction on re-opened trails can be rehabilitated, minimising impact and damage after fires is relatively straight forward and achievable.<sup>38</sup>

Some very good outcomes were achieved by State Forests during the 2002-03 fire crises. For the 22 fires lit by lightning in the Tumut-Batlow-Tumbarumba area, all were suppressed within 3 days with the loss of area being around 320 hectares of State Forest and 260 hectares of national park. A second severe lightning storm on 10 February ignited 20 fires, all were contained on that day and effectively suppressed, with only 10 hectares of forest and plantation lost.

### *The 2002 Joint Select Committee Inquiry*

Following the destructive fires near Sydney at Christmas 2001, the Parliament of NSW created a Joint Select Committee to inquire into the causes of the event. The Committee Report was received with disappointment by many forest managers. It contained welcome directions for the improvement of fire *response* activities, but little political impetus was given to improve the background policies and circumstances in which the fires occur.

The House of Representatives Select Committee should examine the submission made to the NSW Joint Select Committee by NSW State Forests. This submission contained many meritorious arguments which regrettably did not find their way into the final report of the NSW Committee.

The NSW Joint Select Committee heard concerns raised over the benefit of having fire trails in place as they provide access to vulnerable areas, for people to start fires or the dumping of rubbish. While these factors are important, the lack of damage on State Forest land (where there are open and well-maintained fire trails) indicates that their impact is minor and should not prevent the development or maintenance of an adequate fire trail network.

Where atmospheric conditions hamper the ability of authorities to carry out the planned level of hazard reduction burns, are there any alternative solutions?

For example, a report for the Western Australian Department of Conservation and Land Management found that planned hazard reduction actions occur on less than one in four planned occasions.<sup>39</sup> The Director General of NPWS in NSW has said that on 2001-02 there were only six days suited to hazard reduction prior to the fire season. Similarly, a continual failure by Victorian park authorities to meet the fuel reduction targets was also highlighted in the Auditor General's report.

State Forests of NSW were in an excellent position to advise about the management of forests for multiple commercial and environmental outcomes. The NSW State Forests Submission to the Joint Select Committee Inquiry stated the following:

*"The fundamental principles of maintaining reliable access to forested areas, carrying out appropriate fire prevention and mitigation works including hazard reduction, maintaining a systematic approach to fire detection and pre-emptive dispersal of suppression appliances, plant and equipment (scaled up prior to the onset of bad fire weather) and early, determined initial attack by experienced, well-equipped crews once again proved vital in the containment of many fires that otherwise would have reached large and uncontrollable proportions.*

*Of major concern to State Forests is the low, and it would appear declining, implementation of hazard reduction programs in NSW, particularly over the last five years.*

*Legislative changes introduced via the Rural Fires Act 1997, intended to improve bushfire risk management planning arrangements, have not yet yielded improved hazard reduction implementation and outcomes.*

*It is proposed that the high priority given by State Forests to hazard reduction is recognised as a benchmark, and more widely adopted and implemented by other land management authorities."<sup>40</sup>*

### *Victoria – Fire management background*

In Victoria, as in every State, responsibility for fire management and fire fighting is divided among agencies with different cultures and objectives. In regard to responding to fires,

*"the Country Fire Authority is responsible for fire prevention and response on private land outside the Melbourne Metropolitan area; the Department of Sustainability and Environment is responsible for fire prevention and suppression on Victoria's 7.7 million ha of public land."<sup>41</sup>*

The responsibility for preventing fires is even more divided.

The Code for Fire Management in Victoria (CNR 1995) defines five Fuel Management Zones (or "FMZ"s) for all public land. The location of these five zones is negotiated regionally between land management agencies, specific interest groups, neighbouring communities and the public in general. The nature of each of the zones are as follows:

- FMZ 1 is designed and managed to provide high value assets such as townships and timber plantation with a high level of protection. These zones are limited in extent, for example, in Gippsland they represent about 3% of the public estate, and are generally located on the fringes of the forest.
- FMZ 2 is designed and managed to provide strategic barriers to the run of a major bushfires and represent about 17% of the public estate. These areas should significantly reduce the intensity of a bushfire and provide an area in which fire suppression works should have a better than average chance of success.
- FMZ 3 areas are designed and managed to give broadscale fire protection and represent about 43% of the public estate.
- FMZ 4 and 5 areas are primarily managed to meet ecological objectives and are each about 20% of the public land estate.

The cost of conducting fuel reduction burns in the different zones can vary significantly, across Victoria. In FMZ 3 areas broad-scale fuel reduction burning costs between \$5 and \$50 per hectare. For smaller areas of between 10 hectares and 70 hectares, the cost will be about \$50 per hectare and for areas greater than about 500 hectares the cost reduces to \$10 or less per hectare.

In FMZ 2, 4 and 5 areas the cost is about \$30 and \$300 per hectare, that is about six times that in FMZ 3.

In FMZ 1 areas the area cost is generally between about \$40 and \$500 per hectare, about ten times the cost of broad-scale burning. These higher costs are due to the generally smaller areas being treated, the greater level of suppression resources needed to maintain a high level of safety, and the greater amount of blacking out and petrol required. In one day, 10 hectares may be achieved in with a given level of resources or the same resources could complete a 200 hectare burn in the same time in an FMZ 3 area.

Therefore, for a given level of resources, if hazard reduction efforts are concentrated in FMZ 1 and 2 areas the total area burnt will be less, but the effectiveness in terms of asset protection will be greater.<sup>42</sup>

#### *Victoria – 2002 Fire Ecology Working Group Study*

In March 2002 the State Department of Natural Resources and Environment and the national park management agency Parks Victoria issued a jointly commissioned study on fire disturbance.<sup>43</sup> This is an important document, which studied the state of vegetation across Victoria and concluded that a large number of areas required high priority fire management attention.

In analyzing both the degree of biodiversity across the environment and the corresponding vulnerability to fire, the report studied the extent of diversity of 'age classes' in each vegetation type. It then developed a benchmark for the 'ideal' state for each ecological 'vegetation classes' it identified around the State. Alarming, the study concluded that

*"there is only one [vegetation class group] which satisfies the benchmark across Protected Areas, and none across State forest and other public land."<sup>44</sup>*

The report also made the following comments, which are a remarkable and simple summary of the fire management problem facing Australia today.

*"...high frequency fire has recently been nominated as a threatening process under the Flora*

and Fauna Guarantee Act 1988. The results from this analysis indicate, however, that over-burning is not occurring at either a Statewide or at a bioregional scale. These results suggest that the threat which fire frequency poses to species composition and community conservation in Victoria is in fact from under-exposure to fire; ie. Fire frequency is too low across the landscape.

Neither frequent fire nor the absence of fire are desirable; rather a diversity of fire regimes (of varying intensities, scales, seasons and fire intervals) is needed to maintain the biodiversity of these communities. The continued survival of these vegetation communities on a broad scale will rely on the active management of fire across the landscape. While at a single location fire may occur in a vegetation type too frequently, the overwhelming proportion of [vegetation types] with age class distributions far from their 'ideal' clearly indicates that there is a need to promote and target the active use of fire as a tool for ecological management...<sup>145</sup>

The Select Committee should consider this important Report in detail.

#### *Victoria – 2002-03 Auditor-General's Report*

The Victorian Auditor-General issued a very timely audit report in May 2003 on fire prevention and preparedness. Before examining that critical audit, it is worth noting that, a decade earlier the State Auditor-General had issued a Special Report on fire protection which made the following comments:

*“The absolute importance of effective fire protection within Victoria is reinforced by the fact that the State is widely recognised as one of the most fire hazardous areas in the world.*

*This situation poses a real dilemma to government decision-makers in determining the level of financial resources which are necessary, over time, to contain the State's fire risk to acceptable levels.”<sup>146</sup>*

One of the key findings at that Report was:

*“Management of fire prevention and fire suppression in State forests, national parks and other protected public lands is one of the most important responsibilities of government. The (then) Department of Conservation and environment's fire management personnel recognise this position have pursued their responsibility in a consciences and dedicated manner.”*

However, the 1992 Special Report identified a number of short-comings and weaknesses which “raise serious concerns about the State's fire fighting capability in particular areas”.

Specifically, the Special Report found that “many of the State's important fire access tracks, which are vital to effective fire protection, were in a very poor condition”, there was an “under-achievement of fuel reduction burning”, and “around 31% of the Department's fire fighting equipment was obsolete and required replacement”.

These earlier warnings make the findings of the May 2003 Audit all the more significant.

The 2003 Audit, which was commenced before the recent fire crises from December to February, focussed on the planning, prevention and preparedness measures in place, and on whether they were being effectively implemented. The audit conclusions were that attention is needed in a number of critical areas, including:

- development of a State wildfire safety strategy;
- an increased focus on strategic management of hazard reduction on public land to ensure appropriate targets are set, resources are provided and performance is monitored;
- improved fire prevention and management on private land;
- better management of critical firefighting assets; and

- greater identification of fire emergency access requirements on public land with adequate planning to maintain the road and bridge network.

The Audit noted that integration of planning at a strategic and operational level is a key theme in effective wildfire management.

Among many highly relevant comments regarding hazard reduction, the Audit concluded that the system of fire hazard reductions needed to be better planned and better funded by the State Government:

*“fuel reduction burning ... can no longer be conducted on an opportunistic basis.”<sup>47</sup>*

*“...the activity will remain costly, and fully meeting current targets would require a significantly increased outlay.”<sup>48</sup>*

The Audit identified strong prescriptions on the capacity for hazard reduction. Under this over-prescriptive approach, which also applies in NSW, landholders may be inhibited from carrying out fuel reduction burns in areas adjacent to national parks or state forests at a time when it is most suitable to do so. Specific areas will only be suitable to burn when the weather conditions are appropriate (in terms of fuel moisture, humidity, winds, rainfall, and temperature). It is therefore extremely difficult to come up with the prescribed burning pattern in advance to meet regulatory demands. It can take many weeks to follow through the prescriptive process, effectively losing the opportunity to actually carry out the hazard reduction. This clearly indicates that the regulatory regime is strangling the achievement of its own stated objectives.

The Auditor-General noted that there had been a consistent failure to achieve hazard reduction targets. The opportunity to conduct fuel reduction had been limited by the competition for physical resources and limited availability of accredited supervisors in addition to the weather and the strict conditions that apply.

*“Fuel reduction burning conducted by the DSE is not fully costed internally ... [this] means that the DSE’s budgetary commitment ... lacks transparency and operational managers setting targets for fuel reduction each year do not have the certainty that the resources will be available to achieve targets.”<sup>49</sup>*

DSE employs a greater number of project fire-fighters in seasons of high fire risk. If those people could be retained when the risk has diminished, they could assist with fuel reduction burning and improvements towards meeting the stated targets.

The audit also criticised the knowledge base from which the authorities are operating:

*“DSE’s understanding .....between the level of fuel reduction burning and overall wildfire risk is currently limited.”<sup>50</sup>*

The Auditor-General recommends that as the fuel reduction costs are high, it will be necessary to supplement the current area targets for fuel reduction burning with measures that more accurately reflect the level of risk reduction being sought. That is, other solutions that can pay for themselves are required.

In addition, the Audit concluded that fuel reduction burning needs to become part of the internal budgeting process so that adequate funds are allocated to the process.

With the reduction in forestry activities in NSW and Victoria, there has been a significant loss of personnel and equipment, infrastructure, knowledge and capacity that has not been replaced by the bodies in DSE and NPWS for managing the national parks effectively.

### ***Term of Reference (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;*"

#### *Innovative uses of fuel, including biomass renewable energy generation*

The only fuel reduction strategy currently used by State Governments is prescribed burning. Whilst prescribed burning is a vital component of fire risk management, there are more useful alternatives including traditional resource uses of wood material and new emerging uses such as biomass electricity generation.

Extracted excess wood materials can therefore produce energy from a renewable source, resulting in several important environmental benefits. Fire danger is greatly reduced, forest health is improved by allowing light penetration and regeneration to occur, and air pollution from non-prescribed fires is reduced. Reliance on fossil-fuel based energy sources is also directly reduced.

Biomass power plants, used in many overseas countries with similar forest management and energy issues to Australia, combust wood waste to generate electricity instead of burning non-renewable fuels such as coal, petroleum and natural gas. The material used at the biomass plants are those having no value for lumber or pulp chip production and would otherwise be left on the forest or burned. Biomass power could also provide landowners with a means of securing a revenue source to meet the expenses of removing fire hazards.<sup>51</sup>

#### *Relevant US policy responses*

In response to challenges and fire crises very similar to those facing Australia, the United States Forests Service has developed a mosaic and multiple-strategy approach that includes thinning, fuel reduction reserves and roads. The Initiative, known as Healthy Forests, has strong national government backing.

As their approach draws heavily from forest management science, many of these responses have application to similar Australian conditions.

The excess fuel in American forests have created a crisis situation of tens of millions of acres in the western part of the country. It has been recognised that the catastrophic fires in the US resulted from "radical changes during the last century due to the suppression of fires and a lack of active forest and rangeland management".<sup>52</sup> The forests have become unnaturally dense, unhealthy, overloaded with fuels. Nearly 83% of firefighters surveyed identified the need for fuel reduction as the top priority.

Drought conditions combined with years of fuel buildup from fire suppression and reduced thinning make the lands vulnerable to intense and environmentally destructive fires.

Environmental problems associated with recent US wildfires include sedimentation in municipal watersheds due to erosion, impacts on fisheries (water quality and chemistry changes), destruction of endangered species habitats, soil sterilisation, spread of invasive plant species (such as blackberry in Australia).

The Western Forest Fire Research Centre in the US has been able to demonstrate that fuel treatment programs (that include thinning and prescribed burning) have been able to lower the severity of fires, relative to untreated forests that burn under similar weather and physical conditions. This approach provided fire fighters with open, defensible space and anchor points for low intensity back burning operations.

The US Government's stated goal is to create forest conditions similar to those that existed in the early 1800's. This is to be achieved by thinning forests and retaining the best trees and removing smaller, competing trees. Undesired undergrowth, diseased and dying trees are also removed to prevent fuel ladders transporting fire from the ground to the tree crowns.

The Healthy Forests Initiative "*calls for more active forest and rangeland management ... establishing*

*a framework for protecting communities and the environment through.... thinning, planned burns and forest restoration projects.”*

Thinning operations will be determined with site-specific goals in mind, such as retaining unthinned buffers or dead trees to maintain wildlife habitat. The Initiative is also designed to make use of biomass, rather than simply burn it off. Removing the excess forest vegetation to biomass electricity-generation facilities is now making biomass energy an integral part of forest management in the State of California.<sup>53</sup>

### ***Term of Reference (e)***

***“any alternative or developmental bushfire mitigation and prevention approaches, and the appropriate direction of research into bushfire mitigation;”***

We would suggest that one of the more useful research directions would be the identification of the most appropriate mosaic pattern hazard reduction to reduce fire impacts. Work on this has been done at CSIRO over many years, but has been limited by lack of funding.

### ***Term of Reference (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;”***

When considering the relevance of the existing planning and building codes, it is essential to understand why houses are destroyed in bushfires. It has been repeatedly demonstrated that houses built on the urban fringes of Australia’s cities, in what are termed the bushfire prone areas, are not destroyed by attack from the bushfire fronts.

For the Blue Mountains (NSW) 2001-02 bushfires, Warrington Fire Research Australia Pty Ltd found that house damage and destruction was the result of houses burning down from the inside out. That is:

- Even if the houses or external features of the houses are made from wood, bushfire damage did not result from the bushfire front itself;
- Embers entered the houses through broken windows or were able to collect under open eaves and other inadvertent openings in close proximity to flammable building elements or fittings within the houses;
- The key factor outside the houses is the proximity of vegetation that can continue to burn after the fire front has passed when extremely close to the building elements or can provide embers that accumulate around the timber elements of the houses.

This key recommendations of the Report on bushfire destruction *Bushfire Investigations – Warrimoo, Valley Heights and Yellow Rock, Lower Blue Mountains, NSW, 2001-02*, which should be considered when building in bushfire prone areas, are:

- The glass of windows should be strong enough to prevent breakage by small embers and be protected by either closable shutters or metal flyscreens.
- There should be no inadvertent openings left around the eaves or places close to external timber elements that would allow burning embers to accumulate.
- A vegetation clear zone or low risk vegetation zone extending 9m (30 feet) from around the houses would be sufficient to provide adequate protection from the bushfire front.<sup>54</sup>

CSIRO’s Manufacturing and Infrastructure Technology Division is recognised as Australia’s leading

research group on house loss from bushfires, having studied the effects of all bushfires since the Ash Wednesday fires of 1983. This Group's investigation of the causes of house destruction in the February 2003 bushfire attack on Canberra is consistent with the Warrington Fire Research report. Their scientific assessment of the Canberra bushfire is that homes were lost due to ember attack:

*"...ember attack was the principal cause of house loss in Duffy. Radiation and flames from adjacent houses was a secondary cause of damage. But radiation and flames from the fire front did not play a significant role."*

*"And gardens that were heavily mulched, had dry lawns or loose plant debris caused problems."<sup>55</sup>*

Most of the houses destroyed in these bushfire attacks were built in the years prior to the introduction of the quite stringent Australian Standard AS3959 (Construction of Buildings in Bushfire Prone Areas). Although the evidence of consecutive studies demonstrate that houses are not destroyed due to external timber elements catching alight as the fire fronts pass by, the immediate response of the building regulatory authorities is to tighten the specifications applying to housing design and the use of timber in bushfire prone areas.

A revised version of AS3959 has been circulated for public comment (DR 03182 available from Standards Australia) and is currently being redrafted. The revised standard proposes to restrict the use of timber for decking, cladding, fascia, window frames, doors, door jambs and sub-flooring structural elements. These changes are also inconsistent with the Building Code of Australia, which simply requires that *"A building that is constructed in a designated bushfire prone area must be designed and constructed to reduce the risk of ignition from a bushfire while the bushfire front passes"*.

The remaining risks depend on whether the house has been completed, the protection of windows and whether there is vegetation too close to the house.

At the same time, State Governments and local planning authorities are unnecessarily increasing their regulatory controls over building in bushfire prone areas. In New South Wales, the 'planning for bushfire protection' program is being implemented by the State's Rural Fire Service and Planning NSW. This planning approach extends the requirements for the areas designated as 'Flame Zone' and 'Extreme' hazard conditions under AS3959.

For external applications, fencing, pergolas, garden sheds and decking must be made of non-combustible materials in the Extreme bushfire prone areas. Some councils have developed guideline documents that recommend the use of non-combustible framing materials for the Extreme areas.

A recent report entitled a *Literature Review on the Contribution of Fire Resistant Timber Construction to Heat Release Rate*.<sup>56</sup> indicates that timber framing contributes less than 22% of the fire load within burning houses. As a result, there is no need to exclude the use of external or internal timber use in bushfire prone areas. House destruction is primarily the result of ember attack and components within the houses igniting

Without any manufacturer of fire retardant timbers in Australia, the revised standard and the State regulatory approaches should reflect a better understanding of exactly why houses burn down during bushfires. With due caution to minimise the bushfire hazards around each house, houses do not ignite from the fire front, independent of its duration or intensity. Therefore, there is no real demand for fire retardant timbers and no incentive to invest in the capital equipment required to make such timber products.

There are however, a small number of naturally fire-retardant timbers in Australia. These high density, native forest hardwood timbers have been shown by scientific assessment *not* to ignite when exposed to the intensity of fire and heat that would occur in a passing bushfire front. The timber species that demonstrate natural fire resistance and comply with the fire-retardant criterion of AS3959, include Blackbutt, Kwila, Red iron bark, River red gum, Silver top ash, Spotted gum, and Turpentine.



It is therefore of serious concern that there may be excessive and unreasonable limitations on the use of timber when building in bushfire prone areas. It is most probable that between 2-3 times as many houses would have to conform to the revised version of AS3959 and many that did have to conform with the current standard are likely to be moved into a higher risk hazard category. The revised standard contains the new 'Extreme' risk hazard, for which there are no specifications provided on the house construction elements to be employed, in order to comply with the Building Code of Australia. In its draft form, the revised standard states that houses to be built in the areas assessed as Extreme, are outside the bounds of AS3959.

It has been estimated that complying with the standard could add up to \$30,000 to the costs of building a new home. When compared to the costs and risks of the current building requirements, it is hard to find any justification for these costs to be forced onto new home owners. Over the past 36 years, the total insurance payout for house repair and replacement following bushfires has totalled \$1.06bn. The Canberra bushfires account for one third of that total. To put this figure into context, the home insurance payout for the Sydney hail storm in 1999 was \$1.7bn.

Insurance payouts for house destruction from bushfires across the period 1967-2003 average just \$15m per annum. That is, an average of \$600 per house for every house that has been built in a bushfire prone area. This \$600 average damage bill should be considered against the estimated \$30,000 in additional costs of complying with the regulatory requirements.

In contradiction of all the available evidence, regulators are placing unnecessarily tighter controls on the use of timber for residential constructions in bushfire prone areas. There is a requirement for home owners, builders, specifiers and regulators to understand the causes of houses during bushfire attack and the preventative steps that can be taken to reduce the risks of attack.

### ***Term of Reference (g)***

***"the adequacy of current response arrangements for firefighting;"***

This term of reference will be more appropriately addressed in submissions from volunteer and State firefighting authorities.

### ***Term of Reference (h)***

***"the adequacy of deployment of firefighting resources, including an examination of the efficiency and effectiveness of resource sharing between agencies and jurisdictions;"***

This term of reference will be more appropriately addressed in submissions from volunteer and State firefighting authorities.

### ***Term of Reference (i)***

***"liability, insurance coverage and related matters;"***

As mentioned above under the Impacts of fires, there is a direct insurance cost to both public and private forest managers from the increasing risk of fires.

It should be noted that attempts by State Governments to contain funding for fire prevention measures may in fact result in net losses to the public treasuries even if fires do not take place, simply through growing insurance costs.

### ***Term of Reference (j)***

***“the roles and contributions of volunteers, including current management practices and future trends, taking into account changing social and economic factors.”***

The Select Committee is asked to acknowledge the vital role played by volunteer forest industry workers in fighting fires.

Unfortunately, the number of forestry workers available to play this role has been declining due to policy-driven elimination of timber industries in many regions.

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## Endnotes

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