

# Are Big Fires Inevitable?

A Report on the National  
Bushfire Forum

27 February 2007

Parliament House, Canberra





## **NATIONAL BUSHFIRE FORUM, PARLIAMENT HOUSE, CANBERRA, 27 FEBRUARY 2007**

The National Bushfire Forum 'Are Big Fires Inevitable?' - marked a significant step towards a better understanding of large bushfires in populated areas of southern Australia.

The day was not about attributing blame or promoting single issue causes, but about gaining a greater understanding of an increasingly complex issue; what should be done, who needs to contribute, what is the research agenda needed to help define and underpin new policies and practices for the future.

Since the decision to establish the Bushfire CRC following the major fires in New South Wales in 2001/02, we have had further devastating fires in 2003 in Canberra and the Alps, in 2005 in the Eyre Peninsula and the Perth Hills, in January 2006 in the Grampians, NSW mid-north coast and the Southwest Slopes and the Victorian fires of December 2006 and January 2007. We know there is a similar picture in other fire prone parts of the world.

The accumulated toll of loss of life and property combined with vast environmental damage plus the frequency of occurrence of these severe fires has raised concerns that we may be facing a new paradigm that questions our current thinking on how to balance fire suppression and fire prevention, on managing the land, the environment and water resources, and on the role of communities.

The Forum provided a platform to hear the views of practitioners, politicians, policy advisers and researchers on the issue and what needs to be done if indeed we are dealing with a new paradigm.

We are indebted to the advice of the panel who recently reviewed the Bushfire CRC that recommended the CRC should take a stronger role in promoting discussion on major bushfire issues.

Hosting this event at Parliament House seemed a fitting location for an issue that is so important to the Australian economy, environment and community. It also allowed participation by our political leaders and we were pleased to have their active involvement.

While attendance at the event was restricted by the venue and format, the proceedings were made much more accessible by the excellent coverage on ABC local radio and through the ABC website [www.abc.net.au/canberra/bigfire](http://www.abc.net.au/canberra/bigfire). This was a very good example of the valuable role played by the ABC in its role as the official emergency services broadcaster and we appreciate the support.

In addition to the support the Bushfire CRC receives from the Australian Government Department of Education Science and Training, we appreciate the sponsorship support for this event provided by the Department of Transport and Regional Services and the Department of Agriculture Forestry and Fisheries, and the Murray Darling Basin Commission. We also appreciate the collaboration of other CRCs especially the CRC for Sustainable Forests and the eWater CRC who participated actively in the event.

This report of the Forum is intended to capture the main issues and ideas on a way forward.

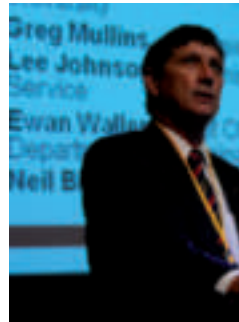
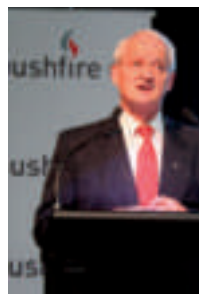
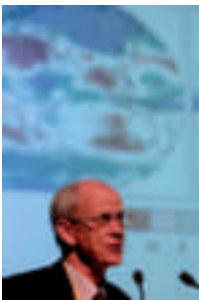
The report contains:

- A short report on the forum proceedings
- A list of speakers on the program
- The keynote presentation by Jerry Williams, Senior Advisor, The Brookings Institution.
- ABC online reports of the forum

The Bushfire CRC website ([www.bushfirecrc.com](http://www.bushfirecrc.com)) contains a comprehensive coverage of the Forum including audio files of the speakers and photographs from the day.

The Bushfire CRC and its partners look forward to an ongoing, enhanced dialogue on the issues surrounding big fires and what needs to be done through fire and land management practices, policies, and further research to adequately address an issue of such national importance to the economy, the environment and the community.

**Kevin O Loughlin**  
**Chief Executive Officer**  
**Bushfire CRC**



## **ARE BIG FIRES INEVITABLE?**

### **A NATIONAL BUSHFIRE FORUM CONVENED BY THE BUSHFIRE COOPERATIVE RESEARCH CENTRE, PARLIAMENT HOUSE, CANBERRA, 27 FEBRUARY 2007**

#### **A Short Report**

In recent years concern has grown among fire agencies, land management agencies, policy makers and researchers about the apparent increase in the frequency and intensity of very large bushfires in the populated, areas of southern Australia in the last decade.

On 27 February 2007 a national forum at Parliament House, Canberra involving some 150 participants across the spectrum of practice, policy and research addressed this issue. Some 34 keynote speakers, panellists and a participative audience addressed questions such as Are we seeing a change? and, if so, What is causing it? What are the implications for fire and land management? and What are the issues for other natural resource sectors affected by bushfires, such as water resources, forestry and the environment?

While it was not possible in a one day forum to achieve a general consensus on many of the controversial issues discussed, this summary aims to bring out some of the key messages from the day, to point to directions for the future, and specifically identify those broad issues that will benefit from further discussions at the national level in the near future.

An Australian Government political perspective of strong and diverse interest in the bushfire issues was provided through direct input of three federal Ministers. The Speaker of the House of Representatives, the Hon David Hawker attended part of the forum and a number of ministers were represented by staff and officials. The Australian Government is especially interested in the follow up to the national inquiries conducted following the 2003 Canberra and Alpine bushfires namely the report of the House of Representatives Inquiry into the 2003 fires chaired by the Hon. Gary Nairn who opened the forum, and the Council of Australian Governments (COAG) Inquiry on Bushfire Mitigation and Management.

Forestry Minister Senator the Hon. Eric Abetz, who had recently visited fire affected areas in Canberra, Victoria and New South Wales, gave his perspective on bushfires in the context of national forestry policy, and improvements he sees are necessary in clarifying responsibility for fires in different land tenures.

Attorney General the Hon. Philip Ruddock spoke of his responsibility for the national emergency management and disaster relief arrangements, and the role the Australian Government had played in providing funding under these arrangements, as well as support for action on the 2003 fire inquiries, support for the National Aerial Fire Fighting Centre and support for the Bushfire Cooperative Research Centre. The Australian Government is committed to working with the States through mechanisms such as COAG on improvement to methods of fire and land management.

The national forum in Canberra took place against an international perspective on some new policy perspectives being developed in the United States. The US experience over the last decade or so is of an increasing frequency of megafires affecting populated areas. These fires have increased in size and frequency despite substantial increases in suppression resources. The main factors appear to be a climate-warming trend consistent with climate change scenarios, increased fuels and expanding urban interfaces in fire prone areas. This has led to a re-examination of the balance between suppression and prevention and to a greater focus on issues such as year-round land management practices, policies, planning and even legislation. It was interesting to note that within the US there are some examples of widely different outcomes from different approaches to the balance between prevention and suppression. Apart from the US and Australasia, very large fires have featured in recent years in other areas of the globe, notably the fire prone Mediterranean countries.

While climate change is not the only factor affecting the increased incidence of large fires, the summary briefing provided to the forum by climate change experts covered opinion from the recent report of the Intergovernmental Panel on Climate Change, studies based on analysis of the effect of rainfall and temperature variability using historical data and projections of the regional impacts on fire danger based on CSIRO regional scale modelling. These views confirm that global warming is now unequivocally occurring, that in Australia rainfall and temperature variability in temperature and rainfall has a distinct impact on factors such as area burnt and the timing of the start of the bushfire season. In most parts of southern Australia, the modelling of future climate change scenarios involves higher average temperatures, more extreme temperature days and reduced rainfall – all adverse for bushfire risk.

Apart from any global warming influences, views were put to the forum that in Australia, as in the US, fuel quantities were a major factor in the incidence of catastrophic fires. Drought was clearly a factor in the build up of dry fuels, but this was also at a time of a reduction in prescribed burning. A stark choice was posed – that we have a choice between very large, uncontrolled burns in summer or a marked increase in planned, cooler burns.

A panel of state bushfire commissioners and chief officers addressed the practical and strategic issues arising from the major fires of recent years in southern Australia, including the early start to fire seasons, and, in most cases, the practical difficulty of achieving prescribed burning targets. The major bushfire management agencies recognise that, while these very large fires require substantial suppression efforts to protect life, property and major community assets, there is also a need for a more strategic approach that addresses land management issues, other natural resource management issues, new approaches to managing volunteers in long running campaign fires, and strengthened community engagement.

A majority supported a more vigorous approach to prescribed burning, including broad-scale burning in suitable conditions. However, some have the view that the scale of fuel treatment that this implies is not practically achievable, would be very costly and would not be accepted by the community, and hence they favour a more precisely targeted approach with a focus on the urban interface and other major assets.

While there is widespread support for prescribed burning as part of good land management practices and to reduce the risk of very large fires, there were differences of opinion among scientists and practitioners present at the forum as to the need for and feasibility of broad scale fuel reduction burning as distinct from the more targeted fuel reduction burns around key assets. There was also recognition that decisions on the prescription will vary and that current research on prescribed burning was essential to finding a more sophisticated approach, including burning guides for different parts of the country.

The Western Australian experience with the integration of fire, land and environmental management has achieved success over a number of decades, and, while not completely applicable to states with even larger forested areas, bigger population centres and steeper terrain, offers a useful model.

All fire chiefs agreed that increased year round activity would require an increase in people with skills in fire management and an appreciation of the environmental aspects. This would place additional demands on volunteers. There is considerable concern about strategies to maintain or increase volunteer numbers at a time when demographic trends are reducing the pool of available people. The scope and depth of volunteer training has increased considerably, though one rural service is considering some relaxation of formal training and certification requirements to allow more flexibility and increase the pool of available recruits.

Fire chiefs with rural, public land and urban interface responsibilities, a social science researcher and a professional communicator addressed community issues in a Fire and Communities panel. Community engagement has become even more critical in the face of increased bushfire activity and the rapid expansion of housing into the bush in both major cities and many rural centres. Diversity of communities and advances in communications technology mean that public education activities and

information flow to and from communities need to be tailored to suit. There have been some excellent examples where successful community engagement has been a major factor in minimising losses in major fires. Increased community representation at forums such as this was recommended.

The links between bushfire and forestry were examined by a panel with representatives from the federal government, two of the leading forestry universities and a forestry industry representative. Forestry has traditionally played a strong role in overall fire management, but the presence and influence of the profession has declined due to the structural changes in the forestry sector, especially the trend of divestment by governments and an increasing focus on commercial aspects of timber production, including plantation timber. The links between land management and forestry are very strong. There is a need for a strengthened national focus on bushfire possibly a national bushfire policy. The Australasian Fire Authorities Council, as the peak industry association body for fire and land management agencies, and the Forest Fire Management Group with its links to the Primary Industry Ministers Council of COAG, would have a role to play in the development of this.

The forum noted that, in relation to follow up on the two major national bushfire inquiries arising from the 2003 fires, follow up on the fire and emergency management aspects had been stronger than follow up on the forestry and land management aspects. It was important to find mechanisms to gain greater traction on addressing the outstanding issues from the 2003 fires as well as issues that have become more prominent in the last two or three years. In particular, the forestry group endorsed the view that more research work was needed on the relationship between fire, forestry, water and other natural resource assets.

Fire and water resources has emerged as a major issue because of the potential impact of major fires on water catchments, such as occurred in Canberra and NE Victoria in 2003. The 2006 fires in Victoria threatened one of major catchments that supplies Melbourne. The forum heard of the impact of younger, fast growing trees on reducing rainfall run-off for many years after major fires. On the other hand, some work is now underway in Western Australia to look at the use of prescribed fire as a possible way of achieving the twin objectives of increased water yield and hazard reduction. Substantially more research is needed in this important area as there is insufficient evidence in most cases to embark on significantly changed management practices.

Fire and land management presents many challenges in the context of managing the environment. Often multiple, conflicting objectives and values are involved, especially in prescribed burning. It is important to have a system that has the appropriate checks and balances, yet allows operational speed and flexibility to ensure effectiveness. A continuing challenge is to balance the needs of a small part of an ecosystem against the needs of the whole ecosystem. It is also important to keep in mind that fire management has cultural and heritage dimensions and these need to be understood. Indigenous burning practices and the acceptance of large scale annual burning of tropical savannas are good examples.

While it was not possible to address in depth at this forum the economic aspects of bushfires, it was noted that the economic impacts of very large fires were high. Costs went well beyond the costs of lives and property lost. The costs to the environment were not easily estimated and some of the secondary impacts were substantial and long lasting, for example the major impact on tourism in the recent Victorian fires.

### **Big Fires Are Inevitable - Policy, Practice and Research Issues for the Future**

An issues and actions arising panel summarised the key issues for follow up, and possible mechanisms. While not denying the need and scope for improved preventative management, or that we must passively accept that very big fires are part of the natural order, the majority view at the forum was that the risk of large forest fires that threaten major population centres in Australia was likely to increase due to the build up of fuels, climate warming, and increases in populations at risk in the urban fringe.

Key issues for follow up included:

#### Land Management Aspects of Fire

- While the fire suppression and emergency management aspects had received increased attention since the 2003 fire, the land management aspects had not been so effectively addressed. This was perhaps a gap in the follow up to the 2003 inquiries. A mechanism would be to give the issue of fire in a land management context greater prominence, especially political attention, in forthcoming meetings associated with the Primary Industries Ministerial Council and the Natural Resource Management Ministerial Council. This would complement the work done by the Police Ministers Council on fire and emergency management and disaster mitigation.

#### Prescribed Burning on Public Land

- There is a need for a greater national consensus on approaches to prescribed burning, and, noting that the prescription will vary depending on location, fuel types, etc, mechanisms are needed to better identify the appropriate treatment options. The Forest Fire Management Group, AFAC coordination and the Bushfire CRC s research all have a role to play.

#### Efforts to Increase Numbers of Fire and Land Managers

- The nation needs to ensure it continues to have adequate numbers of trained and skilled fire and land managers. This is also a matter for the Forest Fire Management Group to address.

#### Adequate Funding for Fire Management and Research

- Efforts to increase programs of prescribed burning imply an increase in resources for this activity. This will need to be addressed by the responsible jurisdictions. The increase in national research effort since the formation of the Bushfire CRC was welcome and it was essential that on-going funding be found to ensure a strong national research effort continues. The industry must have evidence to support its decisions.

#### Bushfires, Climate Change, Water Supplies, the Environment and Forestry

- Further research is needed on the possible impacts of climate change on the frequency and severity of bushfires, and the potential consequential impacts on water supplies, the environment and forestry resources. It will be important to strengthen research in these areas and the linkages between existing research centres addressing different aspects of the problem.

#### A National Bushfire Policy

- The Forum agreed that because of the number of linkages to different areas of policy, there was need to develop a more coherent national bushfire policy. The bushfire challenge needs political support and leadership. The fire and land management industry peak body - the Australasian Fire Authorities Council, which has already played a role in a stronger national approach on issues such as the stay and defend or go early policy, clearly has a role to play. AFAC has links to Emergency Management Australia and the Forest Fire Management Group. An option could include development of best practice templates with agreed sets of performance indicators.

#### Community Engagement

- As an industry, the resources allocated to understanding communities and community engagement are inadequate, compared with suppression , and even mitigation . We clearly need more research in this area.

#### Inquiry Mechanisms

- We need a new process for Inquiries, one that is effective, efficient and fair. Some of the coronial processes have become tortuous and unproductive. The Stretton report into the 1939 fires was completed in three months. Four years is an excessive time and the nature of the inquiries is likely to discourage good people from pursuing careers in fire and land management.



### Maintain International Links

- The international perspectives presented at the forum, especially those from the USA were valuable and indicative that similar issues are facing other fire prone countries. It was important that Australia and New Zealand maintain these links to share experiences and improved approaches.

### Big Fires, Climate Change, Policy and Law

- Situational assessment and data analysis is needed to gain a better understanding of issues such as
  - the impacts of climate change;
  - fuel accumulation; and
  - demographics and planning issues regarding the urban interface;
- Improved national data analysis on areas burned, areas protected, costs and losses;
- Comparative studies to gain a better understanding of the effects of different policy and management approaches in fire prevention;
- Approaches to developing fire and land management policy that supports the right mix of prevention, mitigation and suppression;
- Scenario planning to optimise values to be protected water, biodiversity, carbon sequestration, people and property;
- Consideration of the legal framework needed to support the revised policies and practices.

### **Moving forward**

The range and quality of input to this Forum is an example of the value of a Cooperative Research Centre working in an area of important public interest, where the links with its industry and research partners, with governments and with other parties can bring a spectrum of interests to the debating table.

While some of the possible actions arising from this Forum lie with others, the Bushfire CRC will continue the dialogue on this and similar issues and aim to strengthen the links between research, practice and policy.

# National Bushfire Forum Program

## Master of Ceremonies

Ian Mannix

*Manager, Emergency Broadcasting and Community Development  
ABC Local Radio*

## Welcome and Introduction

Kevin O Loughlin

*CEO, Bushfire CRC*

Ian MacDougall

*Chairman, Bushfire CRC*

The Hon. Gary Nairn, MP

*Special Minister of State*

Senator the Hon. Eric Abetz

*Minister for Fisheries, Forestry and Conservation*

## Keynote speakers

### The Megafire Reality

Jerry Williams

*Senior Advisor, The Brookings Institution, USA*

### The Climate Link to Big Fires

Neville Nicholls

*Professorial Fellow, School of Geography and Environmental Science  
Monash University*

Will Steffen

*Pro Vice-Chancellor (Research), Australian National University*

### An Australian Perspective on Big Fires

Phil Cheney

*Honorary Research Fellow CSIRO*

## Bushfire Panel

### Panel Chair

Murray Dudfield

*New Zealand Rural Fire Service, National Rural Fire Officer*

### Panelists

Rob Rogers

*Acting Commissioner, NSW Rural Fire Service*

Euan Ferguson

*Chief Officer, South Australian Country Fire Service*

John Gledhill

*Chief Officer, Tasmania Fire Service*

Rick Sneeuwjagt

*Acting Director Regional Services,  
Department of Environment and Conservation, Western Australia*

## Forestry Panel

### Panel Chair

Peter Kanowski

*Professor and Head of School, School of Resources Environment and Society  
Australian National University*

### Panelists

Tony Bartlett

*General Manager, Forest Industries Branch*

Allan Hansard

*Department of Agriculture, Fisheries and Forestry*

Rod Keenan

*Chief Executive, Tree Plantations Australia*

*Head of School, Forestry and Ecosystem Science, University of Melbourne*

## Water Panel

### Panel Chair

Gary Jones

*Chief Executive, eWater CRC*

### Panelists

Rob Vertessy

*Chief, CSIRO Land and Water*

John Riddiford

*Chief Executive Officer, North East Catchment Management Authority, Victoria*

Richard Norris

*Program Leader Education and Training, eWater CRC and Director  
Institute for Applied Ecology, University of Canberra*

## Environment Panel

### Panel Chair

Gordon Duff

*Chief Executive Officer, CRC for Forestry*

### Panelists

Brian Gilligan

*Consultant*

Mark Adams

*Professor, School of Biological Earth and Environmental Sciences  
University of New South Wales*

Alan Andersen

*Chief Research Scientist, CSIRO Sustainable Ecosystems*

Bruce Leaver

*First Assistant Secretary, Parks Division, Department of Environment and Heritage*

## Fire and Communities Panel

<b>Panel Chair</b>	Ian Mannix	<i>Manager, Emergency Broadcasting and Community Development, ABC Local Radio</i>
<b>Panelists</b>	John Handmer	<i>Professor and Head of Human Security Program, RMIT University</i>
	Greg Mullins	<i>Commissioner NSW Fire Brigades</i>
	Lee Johnson	<i>Commissioner, Queensland Fire and Rescue Service</i>
	Ewan Waller	<i>Chief Officer, Fire and Emergency Management Department of Sustainability and Environment Victoria</i>
	Neil Bibby	<i>Chief Executive Officer, Country Fire Authority</i>

## Forum Summary from the Chairs

<b>Moderator</b>	Ian Mannix
<b>Panel Chairs</b>	Murray Dudfield
	Gordon Duff
	Gary Jones
	Peter Kanowski
	Kevin O Loughlin

## Comments by the Attorney General

The Hon. Philip Ruddock *Attorney General*

## Actions Arising

<b>Panel Chair</b>	Barry Carbon	<i>Consultant</i>
<b>Panelists</b>	Tony Bartlett	<i>General Manager, Forest Industries Branch Department of Agriculture, Fisheries and Forestry</i>
	Naomi Brown	<i>Chief Executive Officer, Australasian Fire Authorities Council</i>
	Jerry Williams	<i>Senior Advisor, The Brookings Institution, USA</i>

## Closing Comments

Kevin O Loughlin *CEO, Bushfire CRC*





# The Megafire Reality

By Jerry Williams  
Senior Advisor, The Brookings Institution

Keynote Speech  
National Bushfire Forum  
Canberra 2007

# The Megafire Reality

## *Redirecting protection strategies in fire-prone ecosystems*

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*National Bushfire Forum, Bushfire Cooperative Research Centre, 27 February 2007, Canberra, Australia.*

*By Jerry Williams, Senior Advisor, The Brookings Institution  
Former National Director of Fire Management, US Forest Service*

### **The Setting**

Let me start by first thanking the Bushfire CRC for inviting me to participate. It is timely that you are having this forum and you should be commended for organizing it. I also want to mention some feedback I received from many of the Americans that were recently here to lend a hand in your firefighting effort. To a person, they had high praise for your warm welcome and your professionalism.

This morning, I want to share with you some of what we are learning about the mega-fire phenomenon in the United States and these fires' significance, in terms of re-thinking the strategic direction that wildland fire protection strategies must take.

The trends we are witnessing with global warming, over-accumulated fuels in fire-prone forests, and growth at the wildland-urban interface all suggest that the fire protection strategies we have used in the past may no longer serve us so well in the future. The mega-fire is becoming a powerful indicator of this concern.

In the U.S. Forest Service, our wildfire protection objective has always centred on minimizing suppression cost, property loss, and resource damage; considering firefighter safety, first. This objective has been a critical measure of our performance. But, despite significant growth in fire protection budgets, costs, losses, and damages are on the rise. So are fatalities.

Our protection strategy has always attempted to build firefighting capacity commensurate to the values at risk. The doctrine that has guided us, has aimed at matching an increasing wildfire threat with greater suppression force. Yet, we are finding that there are limits to suppression effectiveness and, as good as we might get with the response, the consequence of the few escapes has gotten out of hand.

Most might agree that our aims and our realities are in conflict.

The mega-fire phenomenon has us challenging conventional strategies and conventional doctrine.

Do we reinforce tactics or do we redefine strategies? Do we see the mega-fire phenomenon as principally a fire operations problem and strengthen emergency response or do we broaden our perspective and see the mega-fire problem in a much larger context; one that involves our management of fire prone ecosystems and one that addresses growth behaviours at the wildland-urban interface?

### **Changes in Thinking**

I want to share America's mega-fire experience, as I see it. I won't attempt to export this experience and suggest that it applies here. I want you to draw your own conclusions about what similarities might exist, in the context of the bushfire threat, as you see it, here in Australia.

In the United States, it seems clear that the fire ground is changing. Despite a three-fold budget increase in the past 15 years and enormous firefighting capacity, the U.S. Forest Service finds itself dealing with an overall increase in acres burned per acres protected and some of the worst fires in its history. Some of you know that, firsthand.

Never mind that, of the roughly 10,000 fires that the Forest Service deals with every year, close to 99 percent are successfully contained at the initial and extended initial attack phase. The problem is that the one-percent of fires that escape and become large, account for about 95% of the total acres burned and close to 85% of all suppression costs.

In the U.S., before 1987, wildfires greater than 2,000 hectares were relatively rare. They got everyone's attention. Today, they may not even make the National Situation Report. Since just 1998, we have had over 200 wildfires greater than 20,000 hectares. In 2002, five Western states suffered wildfires that exceeded the largest they had ever recorded. In 2003, one of those states, California, with perhaps the largest protection capacity anywhere in the world with over a US\$3 billion per year combined preparedness budget - saw the previous year's wildfire record fall to one even worse.

Mega-fires are not occurring due to a want in funding. The worst wildfires on record are coinciding with the highest preparedness budgets we've ever seen appropriated.

In 2002, the National Fire Plan outlined a way to confront the large fire problem in the United States. In 2004, with strong bipartisan support, the Healthy Forest Restoration Act increased federal funding, streamlined some of the planning requirements for fuel reduction projects, and boosted support for state-level fire programs. No one expected the problem to be fixed overnight, but large fire trends are continuing to climb.

This past year in the United States, over 3.9 million hectares burned due to wildfire. Tragically, 23 firefighters lost their lives. In 2006, suppression spending on federal lands, alone, exceeded US\$1.9 billion dollars; another new record. Among all large fires, the 20 worst (about 0.2% of the total) cost over US\$400 million to suppress.

If my calculations are correct, this was the sixth time in the past decade that the worst fire season was eclipsed by one worse, yet, the next year.

A long-gone senator used to be fond of saying, "a billion here; a billion there and pretty soon we're talking real money." The fire protection strategy in America is expensive and promises to become more expensive, unless we make a conscious effort to change course and get serious about the causal and contributory factors that are fuelling the problem. It has gotten to the point where -- at this level of suppression spending -- other work for wildlife, watersheds, forest health, and recreation is going undone. Some are beginning to fear that we are headed to an awful predicament where the cost of emergency response continues to grow without discernible progress, but, worse, reaches the point where there is not enough money remaining to ever hope of mitigating the underlying problem.

Although it is difficult to confront reality, it is even more difficult to move strategies to deal with new realities.

It was T.S. Eliot who observed, "Humankind cannot bear very much reality."

Let me describe reality, as I see wildfire risks, on the national forests in the United States. Three major factors seem to be converging: drought, over-accumulated fuels, and growth patterns at the wildland-urban interface.

Our fire seasons are hotter than ever before. In many places, fire danger indices are commonly exceeded from year-to-year. Our fire seasons seem to be starting earlier and lasting longer. They are also more extensive, now. The recently released United Nations report on climate change found that the past seven years of data indicated the six warmest on record (Intergovernmental Report on Climate Change, 2/2/07). Within the fire services, this finding rings true.

In terms of fuels, the rate of accumulation remains far greater than the rate of treatment. In many areas, insect infestations and disease outbreaks, largely due to drought, are exacerbating the problem. Last month (1/30/07), wildland fire administrators testified in front of Congress that wildfire losses are occurring three times faster than we can treat the fuels that cause them.

Much of the large fire problem in the United States seems to be most urgent and most troubling in these shorter interval fire-dependent ecosystems. They typically occupy the warmer, drier sites. In the western U.S., these sites are commonly at or near the valley bottoms- where people live and work. It is in this interface zone that over 8.5 million new homes have been built since the early 1990s. With few exceptions, most of these homes were built where people wanted to build and how people wanted to build, with little regard to wildfire threats and few regulatory constraints.

Some suggest that perhaps we should simply protect homes at the interface and let high-intensity wildfires reduce the fuels for us. However, this "silver bullet" overlooks important ecological ramifications, involving energy cycles, nutrient cycles, and water cycles. The solution also ignores adverse effects toward other values, including watersheds, endangered species habitat, biodiversity, and the overall health and resilience of the forest. The problems that come with these kinds of solutions may be most acute in the shorter-interval fire regimes where ecological function depends on more frequent lower-intensity burning.

In the United States, our managers and policy-makers are not always aware of the unintended consequences that can accompany the expedient solution. It does not help that sometimes the distances between fire managers, resource specialists, and research has become too great. Before we jump to a "silver bullet," though, we would be wise to staff out the possible consequences and carefully display the second and third order effects that might be likely. In the American experience, these effects often prove more consequential than first expected.

I believe that mega-fires are more than the fire services can solve in isolation. They are emerging as more of a land management issue than the more commonly perceived fire issue.

Let me give you an example. We are finding that resource objectives we could achieve in the 1970s and 1980s in fire-adapted ecosystems, under more moderate environmental conditions, are objectives that we cannot always meet today. In the U.S., for instance, endangered species habitat and watershed protection objectives have often relied on minimizing disturbance and preserving late successional conditions. The objectives counted on fire suppression to maintain these conditions. These land management objectives no longer appear feasible, given today's hotter conditions and increased fuels. In fact, the dense, multi-stored stand conditions and undisturbed biomass that were often the best habitat and best filters may, now, fuel the worst wildfires. Ironically, we may be inadvertently managing for high-consequence wildfires. In this new dynamic, the tragedy of large, destructive wildfires is not limited to the skyrocketing costs of suppression. These wildfires are often burning the very values we are attempting to preserve. The loss of habitat, watersheds, and other critical resources are consequences that may be much more serious; particularly if the losses prove to be irretrievable.

If we are to solve the mega-fire problem in the United States, we are going to need the help of resource specialists that can tailor sustainable land management objectives to the dynamics of fire-dependent ecosystems.

We are also going to need the help of law-makers and policy-makers. Let me follow with another example.

The notion of prescribed burning is a good one, I believe. It has an important place in the management of fire-dependent ecosystems, especially. But, there seems an implicit bias in many of the land management laws that govern our activities. Prescribed burning must be compliant with requirements under the Clean Air Act and, because it

affects the human environment, it is subject to National Environmental Policy Act (NEPA) requirements as well. Prescribed fire may also be subject to requirements under the Endangered Species Act or any number of other laws. But, wildfires remain largely exempt from these requirements, even though their consequences may be much more severe,

When many of these laws were enacted, disturbance ecology was largely unknown and rarely applied. I don't want to argue against the intent of these laws, but I do want to point out that the results of these laws, in a changed environment, may actually be working against the resource, especially in fire-dependent ecosystems. When many of our land management laws were enacted, we often assumed that doing nothing or adopting a passive, hands-off land management strategy was the sure way to best protect the resource. When disturbance regimes stood still, it probably did not matter much. But, today, when climate change and fuel build-up changes the dynamic of disturbance, it is probably time to take another look at what the law achieves. I am not suggesting we weaken these laws; I am arguing that they need to become more sophisticated, with respect to what we are learning about the ecologies of these systems in a changed environment.

Our wildland fire protection strategy is suppression-centric for a reason. It is often too difficult, too cumbersome, and too expensive to attempt doing something much different. But that is a poor excuse to take the path of least resistance and simply fall back to reinforcing today's tactics, instead of taking the more difficult right and redirecting strategies that address the laws, the policies, the plans, and the practices that must change if we hope to solve the mega-fire problem.

As I wrap up, let me suggest a new role for research. In the past several years, research has brought us new knowledge about fire behaviour, fire ecology, decision support, firefighter safety, and more recently the social sciences relating to wildfire. Over the years and, more recently, under your Bushfire CRC, you have made world-class progress in these and other areas. Perhaps, now, one of the most valuable roles that research might play has to do with projecting expected suppression costs, property losses, and resource damages with respect to trends in climate, fuels, and interface development all against different protection scenarios. What are the expected risks and benefits to biodiversity, sensitive species, watersheds, air quality, and interface communities over the long term, given an extension of today's laws, policies, and practices in this changed environment? Are the risks acceptable so that we might go on about our business as we always have, or are they so great that we need to re-define our laws and policies and practices in the context of this new dynamic? Certainly, without the advantage of credible information, few of our publics will ever see the need to change behaviours and few of our lawmakers will ever find the conviction to establish safeguards for the greater good over the longer term.

## **A Challenge**

I don't know that there is a country in the world that has yet confronted the new realities of the alarming trends in climate, fuels, and growth at the interface. Certainly, Australia is poised to be a world leader in this area.

Our challenge, for fire managers today, is to re-define the strategic objective in answer to the trends we see in global warming, over accumulated fuels, and growth at the wildland-urban interface. I'm afraid that the obstacles that lie before us may have many seduced into simply reinforcing yesterday's tactics.

The danger of simply doing what we already do, but perhaps doing it bigger and trying harder, will have our public and political critics believe that the problem and its solutions are confined to the performance of the Fire Services. When we are overwhelmed with the one-percent wildfire, no one will applaud the 99% of wildfires that went well. Disaster and loss will be seen as an operational failure. Fire managers will be held accountable. The common criticism will be, you should have seen it sooner, acted faster, tried harder.

Most will overlook that flawed expectations for the land likely predisposed catastrophe. Fewer, still, will acknowledge that homes were built in places and in ways that made them indefensible.

Denial and anger and blame are among the emotions of confronting reality. The realities of climate change, fuel change, and interface change are a real and serious threat. In this reality, we need to look forward. Looking back will only prove a distraction. It won't accomplish much. It is not that what we have always done is wrong. It is that the circumstances have changed. We need to change with them.

Much of leadership is about situational awareness and seeing problems as they are; not as we wish they were. Much of being a leader is about acting on reality; even when it is difficult.

I leave you with three questions:

- Are big, dangerous, destructive, and costly fires inevitable?
- Can we see these trends and act on them?
- Can we re-direct wildland fire protection strategies?





# ABC Online

Feature articles on the National Bushfire Forum  
27 February 2007.



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Search ABC Canberra

ABC Canberra | [Feature Index](#) | [Story](#)

### 2007 Bushfire CRC forum opens in Canberra

Tuesday, 27 February 2007

**Reporter:** Nicholas Kittel

- Schedule
- Tuning In
- The Team
- About
- FAQ
- Contact Us
- Make us your homepage
- 666 Club

#### Programs

- Breakfast
- Mornings
- Afternoons
- Drive
- Evenings
- Nightlife
- Weekends

#### Your Local Features

- ACT News
- Features
- Podcasting
- Gardening
- Recipes



Minister for Fisheries, Forestry and Conservation Eric Abetz opens the 2007 National Bushfire CRC Forum.

February 27, 2007, Parliament House played host to a national forum presented by the Bushfire Cooperative Research Centre (CRC) a federally funded partnership between 30 organisations including fire and land management agencies, universities, Australian Federal Government agencies and New Zealand fire and forest agencies.

The forum was opened by CEO of the Bushfire CRC Kevin O Loughlin, the Special Minister of State Gary Nairn and Minister for Fisheries, Forestry and Conservation Eric Abetz.

Mr. O Loughlin told the delegation of 100 or more that he hoped research collected by the CRC would continue to help those at the forefront of bushfire management in Australia and abroad.

From here on in it s a matter of delivering the results of research in a usable form to those tasked with managing the landscape and fire when, not if, it comes We have the opportunity, today, to learn more about the complexities of bushfire management, he said.

Special Minister of State Gary Nairn raised the question: are big fires inevitable? The foc us of the forum.

## Story Indexes

Date Published

- Arts and Entertainment
- Arts and Entertainment:Music
- Community and Society
- Community and Society:Drugs and Substance Abuse
- Community and Society:History
- Community and Society:Urban
- Development and Planning
- Disasters and Accidents
- Disasters and Accidents:Accidents:Rail
- Disasters and Accidents:Fires:Bushfire Environment
- Environment:Climate Change
- Environment:Conservation
- Government and Politics
- Health
- Health:Exercise and Fitness
- Health:Mental Health
- Health:Obesity
- Human Interest
- Human Interest:Offbeat
- Human Interest:People
- Information and Communication
- Lifestyle and Leisure:Gardening
- Rural
- Rural:Forestry
- Sport
- Sport:Other Sports
- Weather
- Weather:Phenomena
- Weather:Rainfall

**What's New**

Reviews  
Rural  
Heard it on the Radio

## Your Say

666 Guestbook - Read comments  
666 Guestbook - Add comment  
666 Message Board  
Breakfast Letters  
Tell Alex  
Second Delivery  
Drive it Home

## TV Schedule

Stateline  
TV Schedule  
TV News

## Your Local Information

Counter Disaster Information  
Local Events Diary  
Add an event  
Local Radio Music  
Local Weather  
Local Links  
Jobs at the ABC

## Archived Features

Canberra Bushfires  
Real Canberra  
Canberra Suburbs

Of course they are, he said.

In a country such as Australia we will always have fires, there will always be lightning strikes that start fires, there will always be those maniacs in our community that deliberately start fires. So there is no question that we will always have fires, but whether we will always have big fires is what today is all about.

Mr. Nairn said that there are many factors that could possibly contribute to these megafires, but said fuel loads present in the Australian bush was the big issue.

Issues around drought, climate change - all of those things are very heavily involved in whether fires occur and to some extent where they occur and also to some extent the size ultimately the big fires will only come about when you have something to burn.

Minister for Fisheries, Forestry and Conservation Eric Abetz echoed similar sentiments. He said the increase in the size and frequency of national parks and conservation areas meant that there were many areas of bush that are suffering from a lack of maintenance.

The forests have been neglected with minimal to no management, he said.

Fuel loads are not monitored or managed - all escalating the fire risks. If our forests and communities are to survive this minimal management of our conservation reserves then we need to relearn our fire prevention and suppression strategies. The Bushfire CRC has a leading role to play in this area.

Mr. Abetz praised the Bushfire CRC for their commitment and research.

I'm pleased to see that the Bushfire CRC is addressing some of these concerns. Through research, I hope we will become more aware of fire behaviour and be better placed to manage fire risk and develop fire control strategies to conserve our forests for all uses - recreation, harvesting or conservation - rather than seeing them destroyed by fire.

To forum continues.

## What do you think? Tell us your thoughts in the guestbook

## on the Backyard Other Local and Regional Features

- [The makings of a resilient community](#) [30/03/2007]
- [Initial findings of investigation into possible cancer cluster at the NGA released](#) [29/03/2007]
- [Recycled water a risk to health: University Professor](#) [29/03/2007]
- [Thirst: debut of a multimedia community choir masterpiece](#) [29/03/2007]
- [Banff correspondent](#) [29/03/2007]

[more](#)

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## More About 666 ABC Canberra

Search ABC Canberra



- Schedule
- Tuning In
- The Team
- About
- FAQ
- Contact Us
- Make us your homepage
- 666 Club

### Programs

- Breakfast
- Mornings
- Afternoons
- Drive
- Evenings
- Nightlife
- Weekends

### Your Local Features

- ACT News
- Features
- Podcasting
- Gardening
- Recipes

ABC Canberra | [Feature Index](#) | [Story](#)

## More needs to be done to manage threat of 'megafires': US expert

Tuesday, 27 February 2007

**Reporter:** Nicholas Kittel

In his address to the 2007 National CRC Bushfire Forum, Jerry Williams, the senior advisor to Brookings Institute in the United States, told the delegation of government officials, emergency service workers and associated organisations that the reality of 'megafires' was a clear threat and that more needs to be done to manage the factors that contribute to their severity.

Mr. Williams said that, presently, firefighters dealt more in response than mitigation of fires and that we need to take another look at the way in which we currently fight large bushfires.

"The trends that we are witnessing in global warming, over accumulated fuels and fire-prone ecosystems and growth at the wildlife/urban interface , all suggest that the fire protection strategies that have served us so well in the past may not serve us so well in the future," he said.

Mr. Williams says that throwing more money at the situation, like what has been done in the US, is not addressing the fundamental cause of the problem.

"Despite significant increases in the fire protection budget in the US forest services, costs and losses and damages are all on the



Jerry Williams, the senior advisor to Brookings Institute in the United States, said that firefighters deal more in response than

## Story Indexes

Date Published

- [Arts and Entertainment](#)
- [Arts and Entertainment:Music](#)
- [Community and Society](#)
- [Community and Society:Drugs and Substance Abuse](#)
- [Community and Society:History](#)
- [Community and Society:Urban Development and Planning](#)
- [Disasters and Accidents](#)
- [Disasters and Accidents:Rail](#)
- [Disasters and Accidents:Fires:Bushfire Environment](#)
- [Environment:Climate Change](#)
- [Environment:Conservation](#)
- [Government and Politics](#)
- [Health](#)
- [Health:Exercise and Fitness](#)
- [Health:Mental Health](#)
- [Health:Obesity](#)
- [Human Interest](#)
- [Human Interest:Offbeat](#)
- [Human Interest:People](#)
- [Information and Communication](#)
- [Lifestyle and Leisure:Gardening](#)
- [Rural](#)
- [Rural:Forestry](#)
- [Sport](#)
- [Sport:Other Sports](#)
- [Weather](#)
- [Weather:Phenomena](#)
- [Weather:Rainfall](#)

**What's New**

---

## Reviews

Rural  
Heard it on the Radio

## Your Say

666 Guestbook - Read comments

666 Guestbook - Add comment

666 Message Board

Breakfast Letters

Tell Alex

Second Delivery

Drive it Home

## TV Schedule

---

Stateline

TV Schedule

TV News

## Your Local Information

Counter Disaster

Information

Local Events Diary

Add an event

Local Radio Music

Local Weather

Local Links

Jobs at the ABC

## Archived Features

---

Canberra Bushfires

Real Canberra

Canberra Suburbs

## on the Backyard Other Local and Regional Features

rise and so are fatalities... I would share with you that in the past mitigation and need to take another look at we have been response or suppression-centric... the doctrine the way in which they currently fight large that's guided us was always aimed at matching increasing bushfires.

wildfire threat with increasing suppression force and yet we are finding there are limits to suppression effectiveness - the 'megafire' tends to overwhelm us."

So what does he suggest?

Mr. Williams believes that management of fire prone ecosystems is perhaps the best way to manage fires of the future - an idea that was also put forward Minister for Fisheries, Forestry and Conservation Eric Abetz in his opening address.

"Do we reinforce tactics? Or do we redefine strategies? That's the juncture we are at... They're emerging as more of a land management issue than the more commonly perceived fire failure... if we're going to solve the 'megafire' problem in the US we're going to need the help of resource specialists who can tailor sustainable land management objectives in ways that are consistent with the dynamics of these fire dependent ecosystems."

Mr. Williams believes Australia is in a unique position to develop strategies for dealing with large-scale fires of the future.

"Certainly here in Australia, I believe, you are poised to be a world leader in this area."

"The challenge for firefighters, today, is to evaluate the fire protection strategy that's going to govern our activities in the context of these trends. The danger of simply doing what we already do, but perhaps doing it bigger... trying to do it harder will have our public and political critics believe that the problem and its solutions are confined to the performances of the fire services - we've got to get outside of ourselves."

The forum continues.

[What do you think? Tell us your thoughts in the guestbook](#)

- [The makings of a resilient community](#) [30/03/2007]

- [Initial findings of investigation into possible cancer cluster at the NGA released](#) [29/03/2007]

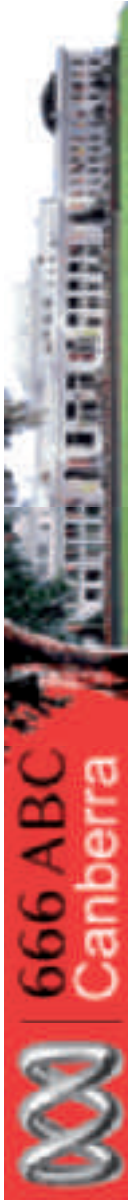
- [Recycled water a risk to health: University](#)

- [Professor](#) [29/03/2007]

- [Thirst: debut of a multimedia community choir masterpiece](#) [29/03/2007]

- [Banff correspondent](#) [29/03/2007]

[more](#)



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## More About 666 ABC Canberra

Search ABC Canberra



- Schedule
- Tuning In
- The Team
- About
- FAQ
- Contact Us
- Make us your homepage
- 666 Club

### Programs

- Breakfast
- Mornings
- Afternoons
- Drive
- Evenings
- Nightlife
- Weekends

### Your Local Features

- ACT News
- Features
- Podcasting
- Gardening
- Recipes

ABC Canberra | [Feature Index](#) | [Story](#)

## Plan to drop training to allow more rural, volunteer, firefighters

Tuesday, 27 February 2007

**Reporter:** Nicholas Kittel

Euan Ferguson is the Chief Officer of the South Australian Country Fire Service. Mr. Ferguson told the 2007 National Bushfire CRC Forum that there are currently plans afoot to see entry requirements and training for the voluntary Country Fire Service dropped, in an attempt to encourage more people to join.

Mr. Ferguson said that many people currently living in remote or rural areas think that the level of training required to be part of a volunteer fire service is excessive and will often help fight fires without having had any training, often placing themselves and others at risk.

**So it's my view that we can actually engage with these people, bring them into the fire service environment as members, but really minimise the amount of training**

become involved with the volunteer organisation.



Chief Officer of the South Australian Country Fire Service Euan Ferguson (second from right) told the forum about a plan to encourage more people to join the CFS.

a member of rural fire service or country fire service or CFA because they don't have the time or (they) think the training is over the top and bureaucratic, but they still turn up with their farm unit so we still wear the legal and health and safety risk," he said.

Mr. Ferguson believes that by lowering the amount of training required to join the service will see more rural residents wanting to

## Story Indexes

Date Published

- [Arts and Entertainment](#)
- [Arts and Entertainment:Music](#)
- [Community and Society](#)
- [Community and Society:Drugs and Substance Abuse](#)
- [Community and Society:History](#)
- [Community and Society:Urban Development and Planning](#)
- [Disasters and Accidents](#)
- [Disasters and Accidents:Rail](#)
- [Disasters and Accidents:Fires:Bushfire Environment](#)
- [Environment:Climate Change](#)
- [Environment:Conservation](#)
- [Government and Politics](#)
- [Health](#)
- [Health:Exercise and Fitness](#)
- [Health:Mental Health](#)
- [Health:Obesity](#)
- [Human Interest](#)
- [Human Interest:Offbeat](#)
- [Human Interest:People](#)
- [Information and Communication](#)
- [Lifestyle and Leisure:Gardening](#)
- [Rural](#)
- [Rural:Forestry](#)
- [Sport](#)
- [Sport:Other Sports](#)
- [Weather](#)
- [Weather:Phenomena](#)
- [Weather:Rainfall](#)

**What's New**

Reviews

Rural

Heard it on the Radio

## Your Say

666 Guestbook - Read comments

666 Guestbook - Add comment

666 Message Board

Breakfast Letters

Tell Alex

Second Delivery

Drive it Home

## TV Schedule

Stateline

TV Schedule

TV News

## Your Local Information

Counter Disaster

Information

Local Events Diary

Add an event

Local Radio Music

Local Weather

Local Links

Jobs at the ABC

## Archived Features

Canberra Bushfires

Real Canberra

Canberra Suburbs

## on the Backyard

### Other Local and Regional Features

- [The makings of a resilient community](#) [30/03/2007]
- [Initial findings of investigation into possible cancer cluster at the NGA released](#) [29/03/2007]
- [Recycled water a risk to health: University Professor](#) [29/03/2007]
- [Thirst: debut of a multimedia community choir masterpiece](#) [29/03/2007]
- [Banff correspondent](#) [29/03/2007]

[more](#)

"So it's my view that we can actually engage with these people, bring them into the fire service environment as members, but really minimise the amount of training to cover off the basics of how you operate on the fire ground safely, how you look after yourselves and how you organise yourselves and it's a bit of challenge but I think we can probably do this in a couple of hours every year over a barbecue."

**I think this is one way of getting those locals back on board, getting them involved in the management.**

Mr. Fergusson said that he has already received some backlash from his proposal, but says he is left in a precarious position by the number of people already leaving the service. He is currently trialling the plan in South Australia and hopes that, if successful, similar plans could be adopted in other states around the country.

"There are people who say to me 'Euan, you are dramatically reducing the entrance requirements to a very professional rural fire service'. But on the other hand we wear the risk anyway and we are losing a huge number of people... I think this is one way of getting those locals back on board, getting them involved in the management. We are trialling it in South Australia... We'll go down the path fairly carefully, but we've got to do something to attract a whole lot more members into our agency otherwise in many parts of rural south Australia, and I imagine that other states would be the same, we're finding that with the drought and rural decline with the burgeoning mining industry we won't have people to volunteer with the rural fire services, we've got to engage with these people, we've got to listen to them, we've got to make entry into the formal part of a rural fire service a lot easier."

The forum continues.

### [What do you think? Tell us your thoughts in the guestbook](#)

#### **Michael from South Australia writes:**

"Removing training standards is absurd. Fighting fires is dangerous. However training has gone over the top recently, the requirements are ridiculous. There has to be a better point of balance."

Last Updated: 1/03/2007 9:34:00 AM AEDT



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## More About 666 ABC Canberra

Search ABC Canberra



- Schedule
- Tuning In
- The Team
- About
- FAQ
- Contact Us
- Make us your homepage
- 666 Club

- Programs**
- Breakfast
- Mornings
- Afternoons
- Drive
- Evenings
- Nightlife
- Weekends

## Your Local Features

- ACT News
- Features
- Podcasting
- Gardening
- Recipes

## Story Indexes

Date Published

- Arts and Entertainment
- Arts and Entertainment: Music
- Community and Society
- Community and Society: Drugs and Substance Abuse
- Community and Society: History
- Community and Society: Urban Development and Planning
- Disasters and Accidents
- Disasters and Accidents: Rail
- Disasters and Accidents: Fires: Bushfire
- Environment
- Environment: Climate Change
- Environment: Conservation
- Government and Politics
- Health
- Health: Exercise and Fitness
- Health: Mental Health
- Health: Obesity
- Human Interest
- Human Interest: Offbeat
- Human Interest: People
- Information and Communication
- Lifestyle and Leisure: Gardening
- Rural
- Rural: Forestry
- Sport
- Sport: Other Sports
- Weather
- Weather: Phenomena
- Weather: Rainfall

**What's New**

## An Australian Perspective on Big Fires

Tuesday, 27 February 2007

Phil Cheney, Honorary Research Fellow with the CSIRO, started by asking the simplest question, but most complex to answer: What is a mega fire?

"Intensity is one part of it, but nothing really special," said Cheney.

Do mega numbers define it? According to Cheney, the numbers of ignitions have been decreasing since 1788 but the large areas of individual fires have been increasing.

Cheney opened with a little history of fires in Australia and a little bit of the science behind the processes of combustion, "Because it was politics that got us into this problem and politics should get us out of it, but they need a bit of reminding about a little bit of the science along the way."

Any fire burning during prolonged drought under extreme weather conditions and with large amounts readily available fuel to burn has the following characteristics:

- The duration of the tall flames is determined by the fuel fineness and the distribution of the fuel
- The heat damage is determined by the total fuel consumption.
- 60-70% of the area will be burnt at high intensity.
- There are practically no unburnt areas within the area of the fire.

Because mega fires are so large, it is inevitable that some part of the total fire area will be exposed to high wind speed and extreme conditions, which can make a fire situation deteriorate quickly, "The bigger the fire you have, the more likelihood that somewhere on it is going to give you extreme behaviour."

What Cheney considered to be the most important thing for the conference to contemplate, something that has been known for a long time to those who deal with fires, is that when these fires occur under drought



Reviews  
Rural  
Heard it on the Radio

## Your Say

666 Guestbook - Read comments  
666 Guestbook - Add comment  
666 Message Board  
Breakfast Letters  
Tell Alex  
Second Delivery  
Drive it Home

## TV Schedule

Stateline  
TV Schedule  
TV News

## Your Local Information

Counter Disaster Information  
Local Events Diary  
Add an event  
Local Radio Music  
Local Weather  
Local Links  
Jobs at the ABC

## Archived Features

Canberra Bushfires  
Real Canberra  
Canberra Suburbs

conditions with a large amount of fuel, everything burns.

Australia has seen these big fires in the past and will experience them in the future, Cheney asserts that we need a new imperative to face up to it, that while mostly in Australia we are not like the aborigines and dependant on fire protection for our livelihood, there are quite a few people in the country who are in that position and are often overlooked. "The environment people in several states have abrogated their responsibility to suppress and manage fires on their estate and have handed it over to emergency services, which has taken it with open arms and in my book that has failed."

If we are always going to have to burn large areas, then Cheney offers us the choice of whether we burn it with multiple fires with a low intensity at the time of our choosing or whether we are subjected to the whims of climate and the weather and we get burnt at high intensity.



Finally, he left us with his biggest concern: that another mega fire event is going to pass without us taking the time to properly investigate and find out the full extent of the damage and explore how to avoid it in the first place through land management and hazard reduction.

## What do you think? Tell us your thoughts in the [guestbook](#)

Last Updated: 27/02/2007 12:30:00 PM AEDT

## Search ABC Canberra

go

 [print friendly version of this page](#) |  [Email this page](#)

## Around The Backyard

[ACT](#) | [New South Wales](#) | [Northern Territory](#) | [Queensland](#) | [South Australia](#) | [Tasmania](#) | [Victoria](#) | [Western](#)

## on the Backyard Other Local and Regional Features

- [The makings of a resilient community](#) [30/03/2007]
- [Initial findings of investigation into possible cancer cluster at the NGA released](#) [29/03/2007]
- [Recycled water a risk to health: University Professor](#) [29/03/2007]
- [Thirst: debut of a multimedia community choir masterpiece](#) [29/03/2007]
- [Banff correspondent](#) [29/03/2007]

[more](#)



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## More About 666 ABC Canberra

Search ABC Canberra



- Schedule
- Tuning In
- The Team
- About
- FAQ
- Contact Us
- Make us your homepage
- 666 Club

- Programs
- Breakfast
- Mornings
- Afternoons
- Drive
- Evenings
- Nightlife
- Weekends

## Your Local Features

- ACT News
- Features
- Podcasting
- Gardening
- Recipes

ABC Canberra | Feature Index | Story

## Coordinated approach to risk management needed

Tuesday, 27 February 2007

A panel of experts from the forestry industry asked questions about how land managers could reduce the dangers posed by big fires.

Chair of the panel, Peter Kanowski started by explaining that the nature of forestry agencies has changed away from broad, public focused objectives, to more commercially focused objectives, and that the responsibility and interests of professionals in the the forestry sector and in relation to bushfire management have changed, "And I think it's fair to say that's been to the evident frustration of many forestry professionals."

Tony Bartlett, General Manager for Forest Industries Branch of the Department of Agriculture, Fisheries and Forestry, believes very strongly that effective fire management is an essential part of sustainable forestry management and also of competitive and viable forest industries.

Forest managers and forest industry personal have traditionally played a very important role in fire suppression and fire management, but they find they are being marginalised in that role in many places. Mr Bartlett expressed the opinion that the last two big fire seasons have shown that the current strategies are failing and that there are very significant consequences of this for the environment, forest industry and for local communities saying, "I believe that a more active approach to fire management is needed."

**We have to recognise that forests are also assets that need to be protected**

"We do need an integrated and active management across all forest landscapes because fire doesn't respect the boundaries. It needs to be well planned and thought about and take into account all the values. We have to recognise that forests are also assets that need to be protected."

## Story Indexes

Date Published

- Arts and Entertainment
- Arts and Entertainment:Music
- Community and Society
- Community and Society:Drugs and Substance Abuse
- Community and Society:History
- Community and Society:Urban
- Development and Planning
- Disasters and Accidents
- Disasters and Accidents:Rail
- Disasters and Accidents:Fires:Bushfire Environment
- Environment:Climate Change
- Environment:Conservation
- Government and Politics
- Health
- Health:Exercise and Fitness
- Health:Mental Health
- Health:Obesity
- Human Interest
- Human Interest:Offbeat
- Human Interest:People
- Information and Communication
- Lifestyle and Leisure:Gardening
- Rural
- Rural:Forestry
- Sport
- Sport:Other Sports
- Weather
- Weather:Phenomena
- Weather:Rainfall

What's New

Reviews  
Rural  
Heard it on the Radio

---

## Your Say

666 Guestbook - Read comments  
666 Guestbook - Add comment  
666 Message Board

Breakfast Letters  
Tell Alex  
Second Delivery  
Drive it Home

---

## TV Schedule

Stateline  
TV Schedule  
TV News

---

## Your Local Information

Counter Disaster Information  
Local Events Diary  
Add an event  
Local Radio Music  
Local Weather  
Local Links  
Jobs at the ABC

---

## Archived Features

Canberra Bushfires  
Real Canberra  
Canberra Suburbs

He calls for a coordinated approach from the international to the local level and that it needs to be an approach which is informed by science and practical experience, "we can't have good fire policy without that."

Alan Hansard, Chief Executive of Tree Plantations Australia, tackled the issue from an economist's perspective, noting that the industry sees fires as a risk which needs to be managed, "Fire events don't necessarily need to happen for you to take appropriate measures to try and manage that risk."

Australia's forest industry focuses to a large extent on minimising the risk factors, "What we can't do is really manage the risk of our neighbours and that's a real problem for the industry."

"As an economist it's hard to rationalise the 'lock up and leave' mentality that we hear about," says Hansard. He quoted sources saying that the forests themselves are worth approximately one thousand dollars per hectare, "If that's the case, the area that's been transferred to native forests and reserves are probably worth around about twenty billion dollars." He asks the question that if this is the value of the asset we have, then shouldn't it be managed appropriately to minimise the risk?

"As an industry we abide by codes of practice, and part of those codes are basically the prescriptions to manage for fire. We'd like those codes to also be adopted by other land managers if we could."

**native forests and reserves are probably worth around about twenty billion dollars**

Rod Keenan, Head of the School of forestry and ecosystem Science at the University of Melbourne, let us in on a little secret, "I've been trying to avoid fire for most of my career after a brief but intense flurry in the 1982/83 fire season in Tasmania," but since developing his career in forest ecology and research has discovered that fire is a natural and at times essential part of the Australian forest landscape.

"For me forestry has always had a broader land management component to it, but as a result of a lot of the debate over native forest management in Australia many people both in bureaucracy and in the general public and I think even some foresters themselves have narrowed down the area of forestry to the area of commercial timber production."

Mr Keenan thinks this has been counterproductive in both the ways that forestry management agencies have been set up and also in the way that those within the industry are interacting with the landscape.

Policy, research needs and education are the three key areas which need to be dealt with and integrated to promote more positive land management in the future, "My answer to the question 'Are big fires inevitable', I don't think they are if we adopt a co-ordinated, well resourced and integrated approach to land management that involves a sound investment in research and education."

## on the Backyard Other Local and Regional Features

- [The makings of a resilient community](#) [30/03/2007]
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- Drive
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- Nightlife
- Weekends

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- ACT News
- Features
- Podcasting
- Gardening
- Recipes

ABC Canberra | [Feature Index](#) | Story

## Engaging the community to build resilience

Tuesday, 27 February 2007

**Reporter:** Nicholas Kittel

How do you go about engaging a community? What builds community resilience? What makes a member of a community want to commit to a communal effort as opposed to taking responsibility for his or her own property?

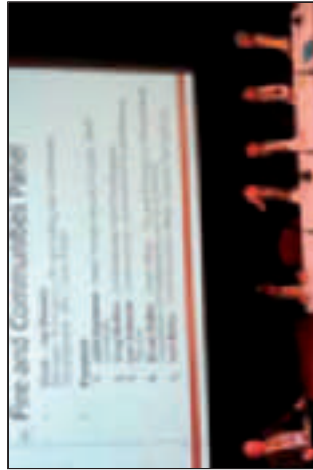
These are all questions that delegates attempted to answer during the 'Fire and Communities Panel' at the 2007 National Bushfire CRC Forum.

The New South Wales Fire Brigades Commissioner, Greg Mullins, told the forum that community engagement is one of the major factors in the battle against bushfires. But he says funding is often tied up in the purchase of equipment as opposed to training of large, community, groups.

**We have to give them knowledge and a full understanding of what to do during the fire so that they're trained for it...**

"One of the big issues that fire services are increasingly facing is that community engagement is the key factor in mitigating the effects of fire, but we are unable to spare much money to do this because people keep telling us we have to put more into big, red, trucks and firefighters," he said.

Mr. Mullins said that is also occurring in the US, where members of the community are often relocated while firefighters do their work.



The 'Fire and Communities Panel' discussed 'building community resilience'.

## Story Indexes

Date Published

- [Arts and Entertainment](#)
- [Arts and Entertainment:Music](#)
- [Community and Society](#)
- [Community and Society:Drugs and Substance Abuse](#)
- [Community and Society:History](#)
- [Community and Society:Urban Development and Planning](#)
- [Disasters and Accidents](#)
- [Disasters and Accidents:Rail](#)
- [Disasters and Accidents:Fires:Bushfire](#)
- [Disasters and Accidents:Environment](#)
- [Environment:Climate Change](#)
- [Environment:Conservation](#)
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- [Health:Mental Health](#)
- [Health:Obesity](#)
- [Human Interest](#)
- [Human Interest:Offbeat](#)
- [Human Interest:People](#)
- [Information and Communication](#)
- [Lifestyle and Leisure:Gardening](#)
- [Rural](#)
- [Rural:Forestry](#)
- [Sport](#)
- [Sport:Other Sports](#)
- [Weather](#)
- [Weather:Phenomena](#)
- [Weather:Rainfall](#)

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Reviews  
Rural  
Heard it on the Radio

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666 Guestbook - Add comment  
666 Message Board

Breakfast Letters  
Tell Alex  
Second Delivery  
Drive it Home

## TV Schedule

Stateline  
TV Schedule  
TV News

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Counter Disaster Information  
Local Events Diary  
Add an event  
Local Radio Music  
Local Weather  
Local Links  
Jobs at the ABC

## Archived Features

Canberra Bushfires  
Real Canberra  
Canberra Suburbs

Mr. Mullins sees this as a wasted asset.

"I've had long discussions with colleagues in the US about their approach to community engagement, which, I don't mean to be disrespectful but I have to say, I don't think they're very good at."

Australians, however, do seem capable and competent when it comes to dealing with natural disasters as a community. Neil Bibby, CEO of the Country Fire Authority, says that Australians, generally, are very good at banding together, but he says correct training is essential to the success of such an effort, although this seems to contradict the South Australian Country Fire Service's program that is trialling less training to encourage greater community involvement.

"We have to give them knowledge and a full understanding of what to do during the fire so that they're trained for it... then make sure, when the fire's on, that they are kept well and truly informed so that they can react appropriately to the danger and the risk assessment they've done personally at a local level," he said.

Mr. Bibby also said that open lines of communication are integral to engaging that community. This communication allows information and coordination to be easily disseminated, reaching every member of the community quickly and easily.

"If we are going to inform the community, we need to do it in an accurate manner and in real time. And we have to do it in such a way that they can collect the information from wherever they are and however they wish to receive the information."

## What do you think? Tell us your thoughts in the guestbook

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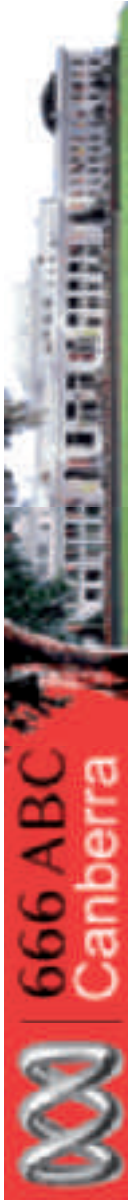
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- [Nightlife](#)
- [Weekends](#)

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- [Features](#)
- [Podcasting](#)
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- [Recipes](#)

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## Environmental experts point the finger back at the government

Tuesday, 27 February 2007

The Busfire CRC panel of environmental experts put forward the opinion that fire management is very much a land management challenge that ultimately is shared by many sectors, taking into account their diversity.

Gordon Duff, Chief Executive Officer of the CRC for Forestry, called for a more coordinated response, "Fire is no respecter of lines on maps, therefore no respecter of land tenure or sectors."

Brian Gilligan, consultant and former Director General of NSW Parks and Wildlife gave three reasons why he thinks big fires are inevitable:

- The nature of the Australian landscape, particularly the complexity of its flora
- Variability of Australian climate, especially now coupled with global climate change
- Increasing complexity of the urban/bushland interface around our major cities and population centres

"Until we can work out where the lightning is going to strike much more precisely and where the somewhat less than ten percent of the fires that are going to get out of control and not be able to be tackled quickly, unless we can get a level of precision in there that isn't on the horizon then I think we are faced with this reality."

This belief doesn't mean that he thinks nothing can be done about managing it and had two things in particular that he thought could be done: more collaboration with regards to strategic planning and to engage in flexible and adaptive operational management.

Professor Mark Adams from the School of Biological Earth and Environmental Sciences at the University of New South Wales says that fire management comes down to the issue of resources, "The increase in area of assets and interface areas causes enormous difficulties."

**The increase in area of assets and interface areas causes enormous difficulties**

## Story Indexes

Date Published

- [Arts and Entertainment](#)
- [Arts and Entertainment:Music](#)
- [Community and Society](#)
- [Community and Society:Drugs and Substance Abuse](#)
- [Community and Society:History](#)
- [Community and Society:Urban Development and Planning](#)
- [Disasters and Accidents](#)
- [Disasters and Accidents:Rail](#)
- [Disasters and Accidents:Fires:Bushfire](#)
- [Environment](#)
- [Environment:Climate Change](#)
- [Environment:Conservation](#)
- [Government and Politics](#)
- [Health](#)
- [Health:Exercise and Fitness](#)
- [Health:Mental Health](#)
- [Health:Obesity](#)
- [Human Interest](#)
- [Human Interest:Offbeat](#)
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- [Information and Communication](#)
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- [Rural](#)
- [Rural:Forestry](#)
- [Sport](#)
- [Sport:Other Sports](#)
- [Weather](#)
- [Weather:Phenomena](#)
- [Weather:Rainfall](#)

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Reviews

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Drive it Home

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Stateline  
TV Schedule  
TV News

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Local Weather  
Local Links  
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Canberra Bushfires  
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Canberra Suburbs

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- [The makings of a resilient community](#) [30/03/2007]
- [Initial findings of investigation into possible cancer cluster at the NGA released](#) [29/03/2007]
- [Recycled water a risk to health: University Professor](#) [29/03/2007]
- [Thirst: debut of a multimedia community choir masterpiece](#) [29/03/2007]
- [Banff correspondent](#) [29/03/2007]

[more](#)

A lack of resources to suppress fires isn't the only issue he predicts. As fire is a natural part of the Australian landscape, for forest regeneration and fuel reduction, we also need to find the resources to control necessary fires in the environment, "It's not just the asset protection zones that we need to be concerned about; we've got to find a way to get fire back into the broader landscape."

Professor Adams finished with his simple plea from the common man, "Penalising individuals for using too much carbon, too much water or threatening biodiversity only encourages individuals to turn the finger back on governments."

### What do you think? Tell us your thoughts in the [guestbook](#)

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## ABOUT THE BUSHFIRE CRC

The Bushfire Cooperative Research Centre is a partnership between 30 organisations including fire and land management agencies, universities, Australian Federal Government agencies and New Zealand fire and forest agencies. It was established in 2003 under the Australian Government's Cooperative Research Centres program and is funded for a seven year period.

Today the Bushfire CRC is looking at a broad range of topics including fire behaviour and suppression, fire as part of the natural landscape, fire weather, community self-sufficiency, firefighter safety and building protection.

Bushfire CRC researchers are working within communities from Victoria's western district to far North Queensland, the alpine regions of New South Wales and Victoria, to the Tasmanian forest regions, South Australia's Eyre Peninsula and the tropical savannas of the north.

The formation of the Bushfire CRC was a major step by the fire and land management agencies and research partners in Australia and New Zealand. It was a move towards a better understanding of the complex social, economic and environmental aspects of bushfires. The combination of partner resources and the Australian

Government's grant through the Bushfire CRC program is a substantial investment in national bushfire research.

Already, this investment is having an impact. New decision support tools are being used in areas such as smoke management, aerial suppression, prescribed burning and fire weather forecasting. Important research has started on the role of fire in the high country. In tandem with researchers, fire and land agencies are gaining an insight into the way people face the bushfire threat.

The Bushfire CRC also has a role in promoting discussion and policy support for big picture issues around bushfire management. It also has a responsibility to educate the general community as well as the next generation of fire researchers through training, knowledge networking, technology transfer, short courses, workshops and public forums.

The Bushfire CRC is very pleased to have the support of its partners and to work closely with the industry's peak body, the Australasian Fire Authorities Council.

## FURTHER INFORMATION

If you would like to know more about the Bushfire CRC please let us know. The Bushfire CRC has produced a range of publications and resources for its members and for the public. Conferences, workshops and community events are also held regularly throughout the year.

Find out more about the Bushfire CRC at [www.bushfirecrc.com](http://www.bushfirecrc.com)  
Or contact us at [bushfireforum@bushfirecrc.com](mailto:bushfireforum@bushfirecrc.com)  
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