

**NSW PARLIAMENTARY LIBRARY
RESEARCH SERVICE**

Bushfires

by

Stewart Smith

Briefing Paper No 5/02

RELATED PUBLICATIONS

- Bush Fire Control in NSW: Commentary on the Cabinet Committee on Bush Fire Management and Control Interim Report, NSW Parliamentary Library Briefing Paper No 8/94.

ISSN 1325-5142

ISBN 0 7313 1708 4

March 2002

© 2002

Except to the extent of the uses permitted under the *Copyright Act 1968*, no part of this document may be reproduced or transmitted in any form or by any means including information storage and retrieval systems, with the prior written consent from the Librarian, New South Wales Parliamentary Library, other than by Members of the New South Wales Parliament in the course of their official duties.

NSW PARLIAMENTARY LIBRARY RESEARCH SERVICE

David Clune (MA, PhD, Dip Lib), Manager	(02) 9230 2484
Gareth Griffith (BSc (Econ) (Hons), LLB (Hons), PhD), Senior Research Officer, Politics and Government / Law	(02) 9230 2356
Rachel Callinan (BA, LLB), Research Officer, Law	(02) 9230 2768
Rowena Johns (BA (Hons), LLB), Research Officer, Law	(02) 9230 2003
Roza Lozusic (BA, LLB), Research Officer, Law	(02) 9230 3085
Stewart Smith (BSc (Hons), MELGL), Research Officer, Environment ...	(02) 9230 2798
John Wilkinson (BA (Hons), MA), Research Officer, Economics	(02) 9230 2006

Should Members or their staff require further information about this publication please contact the author.

Information about Research Publications can be found on the Internet at:

www.parliament.nsw.gov.au/WEB_FEED/PHWebContent.nsf/PHPages/LibraryPublications

CONTENTS

EXECUTIVE SUMMARY	1
1.0 Introduction.....	1
2.0 History of fire and bushfire in Australia	1
3.0 The Legislative Framework for Bushfire Control.....	12
4.0 Bushfire Hazard Reduction Works.....	21
5.0 Bushfires and the Planning System	29
6.0 A Summary of the Bushfire Events of the 2001-2002 Bushfire Season	33
7.0 Conclusion.....	47

EXECUTIVE SUMMARY

This paper reviews the history of fire and bushfire in Australia, including the debate on bushfire hazard reduction burning. It outlines the provisions of the *Rural Fire Service Act 1997*, and provides a comprehensive summary of the fires which occurred in NSW during the 2001-2002 fire season. It is self evident that bushfires occur during periods of hot weather. 'Bushfire weather' in NSW tends to occur when a deep low pressure system is located south of Tasmania, which results in hot, dry, desert westerly winds blowing over the State.

The ecological impact of Aboriginal burning of forests, and ramifications for contemporary fire management, are still keenly debated in the scientific literature. Some of these arguments are canvassed. The experience of bushfire in south-eastern Australia since the late 1800s is traced, and dramatically shows that communities cannot be complacent in the face of the bushfire threat. Appendix One contains a chronological list of bushfires in NSW since the 1950s.

Severe bushfires occurred across eastern NSW in 1994, and in their aftermath several inquiries, led to the reform of the legal and institutional response to the bushfire threat. The *Rural Fires Act* was passed in 1997, and the Rural Fire Service was created. The Service is comprised of a small number of salaried staff, as well as a volunteer force of over 68,000 people. Under the auspices of the *Rural Fires Act*, the main function of the Service is: to provide services for the prevention, mitigation, and suppression of fires in rural fire districts; and the protection of people and property from those fires. The Act states that in carrying out these services the Service must take into account the principles of ecologically sustainable development. The Act also focuses on the development of bushfire risk management plans, which is a significant paradigm shift from the single issue of fuel management.

A recurring debate throughout both the scientific and general community is the effectiveness, required amount and location of hazard reduction burns to reduce the intensity of bushfires. The aim of these prescribed burns is not to prevent fires from occurring, but to reduce the intensity, rate of spread and crowning of those that do occur.

The NSW Bushfire Co-ordinating Committee supports fuel reduction by prescribed burning, and promotes a policy of mosaic fuel reduction burns, except where the main purpose is to provide a buffer zone between the bushland and high value assets. Land managers such as government agencies, local government and private landowners have the legislative responsibility for undertaking hazard reduction activities. Criticisms have arisen that the environmental requirements of the *Rural Fires Act* have made hazard reduction burning more difficult, and hence there has been less of it. These arguments are canvassed.

Tragically, over the last few decades scores of people have died from bushfires in eastern Australia. Building standards as well as urban planning can make a big contribution to bushfire safety. NSW experienced another severe bushfire season over 2001 – 2002, and a daily summary of these fires is presented.

1.0 INTRODUCTION

This paper: reviews the history of fire and bushfire in Australia, including the debate on hazard reduction burning; explains the lead up to the formation of the current Rural Fire Service; outlines the provisions of the *Rural Fires Service Act 1997*; and provides a comprehensive summary of the fires which occurred in NSW during the 2001-2002 fire season.

1.1 Bushfire Weather

It is self evident that bushfires occur during periods of hot weather. 'Bushfire weather' is generally of a short term nature within the climatic variation typical for Australia. Whilst bushfires can be expected any time in the summer season, the worst bushfires tend to occur during the following meteorological conditions:¹

- An extended drought, or after six to eight weeks of dryness in south-eastern Australia;
- Unstable atmospheric conditions;
- Air temperature 37 °C or higher;
- Average wind of 55 kph in the open, or faster;
- Relative humidity of 15 percent or less.

For NSW, typically bad bushfire weather occurs when a deep low pressure system is located south of Tasmania, which results in hot, dry, desert westerly winds blowing over the State.

As the next section shows, severe bushfires across eastern Australia tend to occur when these meteorological conditions prevail.

2.0 HISTORY OF FIRE AND BUSHFIRE IN AUSTRALIA

It is widely accepted that fire had been used as a resource management tool by Aborigines for many thousands of years, and that many of the ecosystems first encountered by Europeans had evolved under a long history of systematic burning. What is less widely accepted is how this knowledge should be incorporated into contemporary ecosystem management. Some biologists and scientists are critical of the fact that the contribution of indigenous people and their systematic burning of forests is not recognised in the evolution of the flora of Australia.² Bowman has referred to the long history and impact of Aboriginal burning as 'one of the most complex and contentious issues in Australian ecology', adding:

This issue is not only important for the development of a comprehensive understanding of the dynamics and evolution of the Australian biota, but is central to the formulation of appropriate strategies for the conservation of the nation's biota.³

¹ Webster, J. *The Complete Bushfire Safety Book*. Random House, 2000, at 24.

² Gott, B. "Fire as an Aboriginal Management Tool in South-Eastern Australia." In *Australian Bushfire Conference*, Albury July 1999.

³ Bowman, D "The impact of Aboriginal landscape burning on the Australian Biota." In *New Physiologist*, Vol 140, pp385-410.

Bowman concluded that fire was a powerful tool that Aborigines used systematically and purposefully over the landscape, and that there is little doubt that Aboriginal burning was skilful and central to the maintenance of the landscapes colonised by Europeans.

The lessons to be learnt from Aboriginal burning may potentially be considerable. Gott notes that one of the lessons is that the timing of fuel reduction burns is vital – too many of them take no account of the ground flora, and if they are not carried out when tuberous ground flora are dormant (and hence underground), as was the case with Aboriginal burning, they can reduce biodiversity.⁴ However, other researchers take a contrary view and argue that pre-European fire regimes are complex and difficult to determine, and inappropriate for contemporary management objectives. This is because, amongst other things, the contemporary landscape is characterised by fragmentation and the presence of feral species⁵

One of the most authoritative works on bushfire in Australia is that by Stephen Pyne.⁶ He notes that there is a long history of fire in Australia, and traces this back from the origins of the continent through to Aboriginal fire use, and from European settlement to modern day.

Pyne noted that NSW has a mosaic of environments that: span the continent's major terrain features, capture the principal biotas, and include samples of most of the continent's fire regimes. Among fire seasons, he estimates that probably 20 percent are serious, 40 percent moderate, and 40 percent mild.

The composite nature of the environments across NSW has been both a strength and weakness. Had a single fire problem involved all of the State, or had all terrains experienced fire at roughly the same time, the State might have been compelled to evolve a coherent strategy of bushfire protection. Instead, fire threats were too episodic and social incentives too ephemeral to enforce any sort of system. As a result, NSW became a political and environmental mosaic, and added new practices and institutions as the British constitution evolved new laws. In its early stages in NSW, fire protection was flexible and accommodating without being particularly effective.⁷

Pyne noted that this evolution changed only slightly with the establishment of the Forestry Commission in 1916. The fires of the 1926-28 fire seasons galvanised foresters into action, with the December 1927 fires alone involving over 2 million hectares. Other fire events raged around Sydney in 1929, the Western Division in 1931, and the Blue Mountains in 1936. Beginning with a Royal Commission report in 1927, the Forestry Commission progressively strengthened its fire mission. The means at hand to do so were of course

⁴ Gott, B. "Fire as an Aboriginal Management Tool in South-Eastern Australia." In *Australian Bushfire Conference*, Albury July 1999.

⁵ Williams J & Gill A *The Impact of Fire Regimes on Native Forests in Eastern New South Wales*. Forest Issues 1. Environmental Heritage Monograph Series No 2, National Parks and Wildlife Service, 1995, at 43.

⁶ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991.

⁷ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 277.

limited. Tools included the rake, hoe, axe, water bag and a box of matches. Roads were poor and vehicles were scarce. Fuelbreaks doubled as means of access and as points from which crews could backfire. Staff were few, and settlers were unorganised. Graziers considered that it was better to set forests alight as frequently as they would burn, rather than protect them for many years so that leaf litter could accumulate. Against this background of 'ordinary citizens' conducting their own fuel reduction burns, foresters proposed a systematic alternative, and also burned off extensively. However, the leading cause of fire in reserved forests was the Forestry Commission's own fire practices, and its often loosely conducted burning off. Serious bushfires broke out in 1929, and it soon became obvious that managing the reserved forest areas was not enough, and that forestry also had to establish a fire protectorate over adjoining lands.⁸

Pyne argues that NSW demonstrated a pragmatic evolution of order, both of law and practice, amid its composite of environments and social classes. He continued that this process might have continued indefinitely had not crisis, in the form of the great holocaust of 1939, intervened. NSW had lacked a coherent fire strategy or rigorous practices because, in part, it had lacked a coherent fire problem. However, the 1939 fires and the continuing crisis of World War Two dramatically changed that perception.

Black Friday

An intense weather system that pushed hot dry desert air across eastern Australia ultimately led to Black Friday, January 13, 1939. Grasslands, which were dry and dusty due to drought, escaped, but forests had high fuel loads that were ready to burn. There were multiple sources of ignition:

Lightning kindled some fires, but most emanated from a register of casual incendiaries that reads like a roster of rural Australia: settlers, graziers, prospectors, splitters, mine workers, arsonists, loggers and mill bushmen, hunters looking to drive game, fishermen hoping to open up the scrub around streams, foresters unable to contain controlled burns, bush residents seeking to ward off wildfire by protective fire, travellers and transients of all kinds. Honey gatherers lit smoking fires. Campers burned to facilitate travel through thick scrub. Locomotives threw out sparks along their tracks. A jackeroo tossed lighted matches alongside a track so that his boss would know where he was. Residents hoping to be hired to fight fires set fires. Possibly a third of the documented fires had no known cause. A self styled bushman shrugged off the multiple sources by explaining to a royal commission that "the whole of the Australian race have a weakness for burning."⁹

Black Friday fires caused 71 deaths. Royal Commissioner Stretton, investigating and writing about the fires stated:

Generally, the numerous fires which, during December, in many parts of Victoria, had been burning separately...reached the climax of their intensity and joined forces in a devastating confluence of flame on Friday, the 13 of January. On that day it appeared that the whole State was alight. At midday, in many places, it was dark as night...the full

⁸ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 278.

⁹ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 310.

story of the killing of this small community is one of unpreparedness, because of apathy and ignorance and perhaps something worse.

...Steel girders and machinery were twisted by heat as if they had been of fine wire. The speed of the fires was appalling. They leapt from mountain peak to mountain peak, or far out into the lower country, lighting the forests 6 or 7 miles in advance of the main fires. Blown by a wind of great force, they roared as they travelled. Balls of crackling fire sped a great pace in advance of the fires, consuming with a roaring, explosive noise, all they touched. Houses of brick were seen and heard to leap into a roar of flame before the fires had reached...such was the force of the wind that, in many places, hundreds of trees of great size were blown clear of the earth,...for mile upon mile the former forest monarchs were laid in confusion, burnt, torn from the earth, and piled one upon another as matches strewn by a giant hand.”¹⁰

The Stretton report was a stinging indictment of Australian fire practices and the apathy that they engendered. After the Royal Commission report was released, an interstate conference on bushfires was convened in Melbourne. With more fires occurring in the years after Black Friday, all the States quickly enacted new bushfire acts and organised bush fire brigades. Stretton noted that foresters had sought to protect forests from settlement fires, not settlement from forest fires. Instead of active intervention, they had relied on nature to control fuels. That left suppression as a response, for which the means available at the time were woefully inadequate. Stretton’s report sanctioned, for the first time from an official source, controlled burning for fuel reduction.

According to Pyne, for NSW the reconstruction began in 1951 when a new Bush Fire Act (of 1949) provided the mechanisms for an effective volunteer brigade force. Its first success was in the Hume-Snowy Bush Fire District, where the NSW Forestry Commission had surveyed the fire protection needs of the Hume-Snowy watersheds (important for the Snowy Hydro-electric scheme). The Commission prepared a plan that called for aggressive protection, involving many of the different land agencies, and the area evolved into a model protection program. The 1951-52 summer season again experienced fires, with 2.3 million hectares burnt along the coast and another 375,000 hectares in the Western Division. The Forestry Commission noted its relative success at protecting state forests and the Hume-Snowy Bush Fire District. It was the unprotected crown land and private lands that bred fire, and it was carelessness and accident that had caused most of the outbreaks. It was also the reckless, disorganised firefighting and panicky backfiring that thwarted efforts at control. However, the Hume-Snowy Fire District scheme ‘shone like a beacon of hope’, and the Forestry Commission and bush fire brigades inaugurated cooperative plans to close the gaps in the unprotected lands in what became known as the South Coast Scheme.¹¹

The Forestry Commission began planning to extend the principles of the South Coast Scheme elsewhere throughout the tablelands and up to the north coast. Again, fires in the 1957-58 season retaught old lessons. Areas subject to protection, the state forests, the Hume-Snowy Bush Fire District, townships along the coast outfitted with bushfire brigades,

¹⁰ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 311.

¹¹ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 329.

fought the fires to a standstill. But on the marginally protected and unprotected lands, the fires burned unchecked. The Blue Mountains suffered the most, and a freak fire incinerated the town of Leura. The resultant public outcry was enormous. Pyne notes that the ‘quiet’ planning that had gone on since 1950 found a receptive political audience, and money. Additional cooperative schemes were quickly organised in the unguarded South Coast hinterland and along the Victorian border, and over the next couple of decades the program expanded to encompass most of NSW. What Pyne refers to as the NSW Scheme demonstrated how, through the orchestration of existing resources, it was possible to extend first-order bushfire protection over a state.¹²

The late 1950s and 1960s witnessed a surge in bushfire research. Researchers such as Alan McArthur led the effort, and Pyne noted the following about his work: “All of these [research] topics revolved around core concepts – on obsession with the holocaust fire, which McArthur considered the fundamental problem of Australian fire protection; an insistence that fire behaviour data had to be packaged into a form useable by fire officers and volunteer brigades; and an unshaken conviction that controlled burning was the only realistic means by which to grapple with Australian fire.”¹³

With scientific justification behind it, controlled burning increased around the nation. However, it was not until the mid-1960s that broadacre burning for fuel reduction became an article of faith. As noted later in this Paper, aerial ignition of prescribed burns was developed and used for the first time by the NSW Forestry Commission in 1967. Fuel reduction through aerial ignition became the underlying basis for what Pyne refers to as the ‘Australian strategy’ for bushfire suppression. For researchers aerial ignition and broadacre burning became the symbol of Australian bushfire suppression. It was considered that nothing short of massive controlled burning could defend rural Australia against holocausts that could sweep through the fireflume of the southeast of the nation. However, Pyne notes that aerial ignition also made the ‘Australian strategy’ very visible to large numbers of Australians, and began to alarm ‘urbanites’ and increase debate about the proper place of fire in the natural environment.¹⁴

1967 saw disastrous fires in Tasmania where the development of bushfire suppression techniques was somewhat slower than on the mainland. A wet winter promoted vigorous growth of grasslands, and then a droughty summer dried out both grasslands and forests. Desert winds in advance of a cold front came in with record velocities. Some 110 fires burned or flared on Tuesday 7 February. In the space of five hours more than 270,000 hectares, 1,300 houses and 128 major buildings burned, and 62 people died. A Parliamentary inquiry found that around 88 percent of the fires came out of unprotected rural and crown lands. The Government was urged to rewrite the Rural Fires Act and adopt the precepts and programs of the Australian mainland strategy. Pyne notes that the Tasmanian fires were ideal for the proponents of this strategy, as they seemed to confirm

¹² Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 330.

¹³ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 350.

¹⁴ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 356.

its tenets, methods and viability. Proponents argued that their methods had universal validity, and their interpretation of the cause of fires inspired them to redouble their efforts to bring controlled burning to the full spectrum of the Australian biota.¹⁵

In recounting the fire history of Australia around the period of the 1960s, Pyne refers to the increasing urbanisation of the rural/bush fringe around major cities, and the extensive migration to coastal and mountain holiday and retirement areas. In many areas, development was located next to volatile bushfire prone forests. In the spirit of the 'new environmentalism' and 'getting back to nature', native and exotic flora flourished. The new landscape reflected changes in social composition and cultural values, and that whilst the mingling of bush and city horrified fire control officers, it was this mingling that was one of the prime attractions of the urban bush.

It is also in the decade of the 1960s that Pyne argues that foresters had to compete with ecologists and others as experts on fire. On virtually every issue, debate rapidly polarized between the foresters' solution of prescribed burning, and other more 'environmentally friendly' solutions. The emergence of national parks and conservation organisations also came at a time when the nation's unique biotas and landforms created a special niche in the new environmentalism. Foresters suddenly found themselves 'enemies of the natural environment', and this had profound ramifications for Australian fire practices.¹⁶

In 1970 the Australian Conservation Foundation released what Pyne describes as a 'reasoned manifesto' on bushfire control and conservation, that captured the sentiments and logic of environmental critics. The ACF recognised that fire in some capacity belonged in the landscape, and that barring a technological revolution we must lean heavily on control burning as a fire mitigation policy. But there were powerful reservations: parks and wildlife reserves should not be managed as if they were commercial forests or wheat fields; controlled burning had become itself a significant source of escape fires; the full biological impact of prescribed fires, beyond their demonstrated effect on fuels, was not known; and fire protection was itself a massive expression of human presence, which violated the illusion of naturalness by laying down fire trails and burning according to human schedules and for human ends.¹⁷

With remarkable suddenness, from 1976 to 1978 the old order of the 'Australian strategy' collapsed. The 'new agenda' demanded: expertise in fire ecology, not just fire danger ratings; precise ecological knowledge, not generic fuel loading; and an ensemble of fires applied and withheld in specific environments, not the singular application of scheduled burns on a continental scale. The NSW National Parks and Wildlife Service developed computer modelling of bushfire behaviour. It was put to a field test with a bushfire that burnt across Morton National Park in 1983. The fire ignited west of the Park, and over the course of four days, burned through private land and state forest, across the Park and finally

¹⁵ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 366.

¹⁶ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 373.

¹⁷ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 374.

into pine plantations. The Parks Service provided hour by hour forecasts of fire behaviour from its computer modelling. At subsequent coronial hearings, critics charged that the absence of broad-acre hazard reduction burning had contributed to the losses by making the fire uncontrollable. The Parks Service chronicled its computer modelling, which deviated from actual fire perimeters by no more than 25 percent. It then projected bushfire behaviour under various conditions of reduced fuels. It was shown that given the extreme weather, any reduction in fuels would have reduced the time the pine plantation was burnt in from 17 minutes to four hours. The proponents of the NPWS program argued that as the computer modelling was sustained both in the field and the laboratory, this effectively nullified the case for broadacre fuel reduction burning.¹⁸

Pyne noted that what most threatened the 'Australian strategy' was the argument that, under the worst weather conditions, fuel-reduction burning failed to make fire control possible. The case for controlled burning was clearly supported by evidence for Queensland and Western Australia. However, for the fire flume of south-eastern Australia, it was not so clear. The Victorian Forests Commission noted case studies that confirmed that hazard reduction burning had, in local sites, diminished wildfire and protected houses and conifer plantations. Pyne writes that what the Commission did not discover was a blanket justification for wholesale fuel reduction. Where controlled burning succeeded, it did so in special, intensively managed sites, typically near developments for which brigades could be called in to fight the fire. The problem was that, in practice, controlled burning affected only a fraction of the land under protection. Whilst even sites targeted along ridgetops and north slopes were burnt, these amounted only to a program of enlarged fuel breaks. These defences proved to be inadequate, as high intensity fires could easily spot across them. The foresters' solution, of course, was for more burning. However, critics argued that precision burning should replace broadacre burning, and that the fundamental question became not whether reducing fuels could help control fires but whether under Australian conditions fuels could be reduced sufficiently to provide the desired protection at the desired costs.¹⁹ As the debate continued, more fires were to impact on the landscape.

Ash Wednesday

By February 16, 1983, there were a considerable number of fires burning throughout the southeast fire flume of southeastern Australia. Drought in its third and fourth year had dried out the moisture in fuels. On February 16, a double cold front intensified, and hot air from the arid inlands was swept east. Bushfires broke out in the morning in South Australia, with devastating effect. Fires started from multiple sources, and fierce winds supported massive spotting. Firewhirls proliferated, with aerial photographs showing a pillar of flame towering to 375 metres at Furner, probably one of several 'fire tornadoes' that crossed the region. Wind instruments recorded mean wind speeds of 40-50 km/h, gusting up to 110 km/h. For South Australia, one afternoon of fire storms resulted in 26 deaths, 196 houses burnt, and 25 to 30 percent of the State's conifer forests burnt.

The fires shifted to Victoria, with 180 fires breaking out on February 16. The sheer volume

¹⁸ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 392.

¹⁹ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 395.

of fires overwhelmed the fire fighting authorities, despite early season fire restrictions and additional firefighters and aircraft stockpiled in anticipation. Powerline failure ignited fires in the rural Western District that killed nine people and destroyed 157 houses. A fire at Mt Macedon, again probably electrical in origin, killed seven people and destroyed 628 houses over the space of ten hours. Heavy spotting, abundant fuels, and a landscape immersed in smoke made suppression impossible. Residents fended for themselves. Fires broke communications, cut off escape routes, and severed the electrical power lines that powered water pumps. A huge fire front burnt through Otway State Forest and around Anglesea and Geelong, southwest of Melbourne. Three lives were lost and 728 structures destroyed. Suspected arsonists lit fires near the town of Sherbrooke, raging through state forests and towns, leaving 21 dead and 238 structures destroyed. Twelve of the dead were firefighters. Around 6.30pm another fire ignited around the town of Cockatoo, taking six lives and several houses. A similar fire around the town of Branxholme killed one firefighter and destroyed ten buildings.

After a violent change of weather in the evening, the Ash Wednesday holocaust concluded within 12 hours of the time it began. Australia had put an armada of people and machinery in to confronting the flames – 558 brigades, 21,000 firefighters, 15 fixed wing aircraft, 13 helicopters, and numerous earth moving vehicles. The fires mobilised much of Australian society, including social, legal and economic institutions both public and private. None of this was possible with the Black Friday fires in 1939, yet the losses were far greater in 1983.

Ash Wednesday claimed 71 lives, including those of 13 firefighters. It destroyed more than 2,300 houses and structures, killed some 350,000 livestock, and scorched more than 350,000 hectares of land.²⁰

After the Ash Wednesday fires, a multitude of inquiries across several States were held. However, the fires did not remove the impasse over fire practices, did not inspire an intellectual or institutional reformation, nor yield any breakthroughs in the theory and practice of bushfire protection. It was merely the latest in succession of Australian bushfire holocausts, neither the first and certainly not the last.²¹

The 1980s and 1990s also witnessed increasing concerns over prescribed burning, both from an ecological and air pollution perspective in major metropolitan cities. For instance, ecological studies found that in some environments fire frequency contributed up to 60 percent of the variation of plant life. Increased fire frequency periods lead to a decrease in the evenness of fire sensitive species.²² In another study it was noted that plant species diversity peaked at ten years after a fire and declined appreciably at 16 years.²³ It was clear

²⁰ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 412.

²¹ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 412.

²² Morrison DA et al, "Effects on fire frequency on species composition of sandstone communities in the Sydney region: Inter-fire interval and time since fire." *Australian Journal of Ecology*, Vol 20, pp 239-247, 1995.

²³ Fox, MD and Fox BJ, "The effects of fire frequency on the structure and floristic composition of a woodland understory." In *Australian Journal of Ecology*, Vol 11, pp 77-85, 1986.

that the debate over prescribed burning was far from over, and more of the contemporary debate is outlined later in this Paper.

In early January 1994, coastal NSW experienced an extended period of extreme fire weather, from Bateman's Bay on the south coast to the Queensland border. More than 800 fires started between December 27, 1993 and January 16, 1994. The areas primarily affected included the coastal plains and nearby ranges. The total area burnt was 800,000 hectares, and the intrusion by fire into Sydney and nearby metropolitan areas occurred in a manner never before documented.²⁴

Tragically, one civilian and two volunteer firefighters lost their lives. In total, 206 homes, mostly in urban areas, were totally destroyed. The NSW Rural Fire Service noted that the low level of loss under the conditions which prevailed was testimony to the many emergency services personnel and others who played a role in life and property protection, and fire suppression. At the height of the campaign, 20,000 personnel were deployed, utilising bushfire teams from interstate, overseas (New Zealand) and the Defence Force.²⁵

The institutional response to the fires was considerable. A Cabinet sub-committee was formed after the 1994 fires, which subsequently recommended a number of reforms including: the mandatory formation of Bushfire Management Committees at the local level; and the preparation of bushfire operational and fuel management plans.²⁶

In addition, the following reports were released:

- NSW Legislative Assembly Select Committee on Bushfires, 17 March 1994;
- Coronial Inquiry – NSW Bushfire Inquiry, released February 1996;
- The Coroner's report was referred to the NSW Bush Fire Coordinating Committee for review and advice to the Government, which reported in May 1996.²⁷

Each of the above reports arising from the 1994 fires are briefly summarised as follows.

2.2 NSW Legislative Assembly Select Committee on Bushfires – 1994

The NSW Legislative Assembly established the *Select Committee on Bushfires* on 17 March 1994. The Committee was required to consider and report on the 1993/94 bushfires without duplicating examination of the evidence before the Coronial Inquiry. The terms of reference included: hazard reduction and fire prevention matters; treatment of victims; compensation for firefighters killed or injured whilst fighting fires; adequacy of equipment and training

²⁴ NSW Rural Fire Service, *A State Ablaze. The January 1994 Bushfires*. 1998, at 4.

²⁵ NSW Rural Fire Service, *A State Ablaze. The January 1994 Bushfires*. 1998, at 4.

²⁶ See: NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 4.

²⁷ *Report of the Coordinating Committee on the Findings of the NSW Bushfire Inquiry*. Submitted to the Hon Bob Debus MP, Minister for Emergency Services May 1996.

available to brigades; the environmental impact of bushfire management and control on biodiversity; and the causal factors of the bushfires.²⁸

The Select Committee made several findings and recommendations, but was restricted in its scope due to various external limitations, including the necessity of tabling the report before the House rose for an election. The recommendations included:

- that all public authorities accept the responsibility to conduct adequate hazard reduction and provide and maintain fire trails on their land;
- that the Department of Bush Fire Services establish a minimum standard for fire trails, directing all government and public authorities to provide a fire trail maintenance schedule to all relevant fire control officers;
- that the Department of Health provide the community with quantitative information as to the effects of controlled burning on human health;
- the adoption of a standard emergency warning signal, which is sounded to get the attention of listeners before the warning is read. (This Standard Emergency Warning Signal was implemented by each state and territory on 7 October 1998);
- that the media be approached with the view to establishing a formal “Situation Report” in the form of a regular bulletin delivered by an authorised officer at the Fire Control Centre;
- the adoption of Australian Standard 3959 into the Building Code of New South Wales;
- that the Parliament establish a Standing Committee on Natural Disasters;
- that the proposed Standing Committee on Natural Disasters be charged with the responsibility of monitoring the standard of bushfire fighting equipment throughout the State . . . and closely monitor the implementation of the Government Radio Network.

The recommendations with respect to fire trails were adopted by the RFS, and the Australian Standard was also adopted as a requirement.²⁹

2.3 Coronial Inquiry – February 1996

The Coronial Inquiry into the 1994 fires was conducted from August 1994 to February 1996. The Report was lengthy (402 pages) and made 125 findings and recommendations.

A major finding to come out of the Coronial Inquiry was that hazard reduction activities had not been adequate in many fire prone areas. The Deputy State Coroner found that:

The evidence satisfied the Court conclusively, that throughout NSW during the period 1989-1993, the fuel load was not managed as intended by Parliament and high fuel loads were principally responsible for the intensity of the

²⁸ NSW Legislative Assembly, *Report of the Select Committee on Bushfires*, November 1994.

²⁹ See: NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 7.

uncontrollable fires.³⁰

The Coroner's Report also found problems with the dual control of bushfire management between local councils and what is now the Rural Fire Service. One of the main problems was that fire control officers were employed by local government, and had no direct reporting line back to the Commissioner of the Service. The Coroner recommended that the Fire Control Officers be employed by the Rural Fire Service.

Other recommendations arising from the Coronial Inquiry included:

- A review of the Act with respect to giving consideration to the NSW Fire Brigade having the power to carry out hazard reduction works;
- That consideration should be given to making it mandatory that development applications in bushfire risk areas be referred to the Fire Control Officer;
- Several recommendations with respect to the planning of, and building developments in, residential areas that are bush fire prone;
- That the Government give serious consideration to how Emergency Services can obtain instant access to the electronic media for the purpose of broadcasting appropriate, accurate information.

2.4 Bush Fire Coordinating Committee Report – May 1996

The Coroner's Report was referred to the then Bushfire Coordinating Committee for review and advice to the Government. The Committee made many recommendations including the following relating to the structure of the Rural Fire Service:

- That a system be implemented based on an enhancement of the status quo, with key operational personnel remaining employed by Local Government, but with clearly defined lines of operational accountability through to the Commissioner of Bush Fire Services;
- That the principle of a ranking system be adopted to reflect the operational chain of command from fire fighter to Commissioner;
- That the Bush Fires Act 1949, be repealed and replaced by a new Act to reflect the recommendations made in this report. In keeping with the recommendation to identify the totality of the volunteer organisation as the NSW Rural Fire Service, the new Act should be titled the "Rural Fires Act of NSW".

The Committee did not support the Coronial recommendations to remove local government from management and control with respect to the Rural Fire Service, and to amalgamate the NSW Rural Fire Service and the NSW Fire Brigade.

The Committee made many other recommendations with respect to: brigade training; funded equipment; standard operating procedures; responsibility for section 13 (which related to

³⁰ NSW Coroner, *NSW Bushfire Inquiry, Findings, Volume 4*, at 362.

bushfire hazard removal by local government) of the *Bush Fire Act*; land use planning (development applications and building applications); permits; and adherence to standards of fire cover.³¹

2.5 1994 Amendments to the *Bush Fires Act 1949*

Various amendments were made to the *Bush Fires Act 1949* in 1994. Some of the key amendments related to planning which included the compulsory formation of Bush Fire Management Committees in districts and compulsory preparation of fuel management plans.

2.6 Joint Fire Services Standing Committee – 1996

A Joint Fire Services Standing Committee was established in August 1996. This Committee has representatives of both the Rural Fire Service and the NSW Fire Brigade. The purpose of the Committee is to: "...oversee the development of cooperative fire fighting arrangements", which was one of the Coronial recommendations after the 1994 bushfires.

3.0 THE LEGISLATIVE FRAMEWORK FOR BUSHFIRE CONTROL

After the 1994 fires, and the numerous inquiries as listed above, it was recognised that the *Bush Fires Act 1949* needed to be updated. In the 'history of fire' section of this paper, it was noted that environmental issues were gaining in importance in the debate about the place of fire in the Australian landscape. This influence is found in the *Rural Fires Act* which was passed in 1997. In particular, the objects of the Act contain a reference to the principles of ecologically sustainable development. The Act also focuses on the development of bushfire risk management plans, which is a significant paradigm shift from the singular issue of fuel management.³²

The objects of the *Rural Fire Act* are:

- (a) for the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts, and
- (b) for the co-ordination of bush fire fighting and bush fire prevention throughout the State, and
- (c) for the protection of persons from injury or death, and property from damage, arising from fires, and
- (d) for the protection of the environment by requiring certain activities referred to in paragraphs (a)-(c) to be carried out having regard to the principles of ecologically

³¹ See: NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 11.

³² Douglas, G "Bushfire risk management planning: A new name for an old toy or will it help biodiversity?" in *Australian Bushfire Conference*, Albury July 1999.

sustainable development described in section 6 (2) of the *Protection of the Environment Administration Act 1991*.

The Act established ‘rural fire districts’,³³ as well as the NSW Rural Fire Service itself. The rural fire districts are constituted around local government boundaries. The Service is comprised of the Commissioner and other staff, and volunteer rural fire fighters. The Commissioner, in the exercise of his functions, is subject to the control and direction of the Minister (section 11). A fire control officer for each rural fire district is employed by the Rural Fire Service. Previous to July 1 2001, district fire control officers were employed by their respective local councils. Upon July 1, these positions were transferred to the Rural Fire Service. The stated objective of the transfer of these staff was to facilitate a more cohesive management approach to the 70,000 volunteers who comprise the Service.³⁴ The transfer of these staff to the Rural Fire Service was also one of the recommendations from the Coronial Inquiries into the 1994 bushfires.

The main function of the Service is to provide rural fire services to the State. The Service is to have regard to the principles of ecologically sustainable development in carrying out any function that affects the environment. Services defined in the Act include: services for the prevention, mitigation and suppression of fires in rural fire districts; the protection of persons from dangers to their safety and health, and property from destruction or damage, arising from fires in rural fire districts (section 9).

The Commissioner may enter into rural fire district service agreements with any local authority responsible for a rural fire district. These agreements may specify functions imposed on both the local authority and on the Rural Fire Service. Over 100 service agreements with local councils have been put in place.³⁵

A local authority may form one or more rural fire brigades for any rural fire district constituted in its area. Alternatively, if a local authority refuses a request to form a brigade, the Commissioner may form a rural fire brigade. The body or person that forms a rural fire brigade is to determine the territory in which the brigade is to operate.

The Act also outlines the general powers of rural fire brigade officers for the purposes of controlling or suppressing a fire, or protecting persons or property from an existing or imminent danger arising out of a fire. Apart from action that is ‘reasonably necessary’, the Act outlines: the power to enter premises; the closure of streets and public places (by officer in charge of a rural fire brigade); making premises safe, by pulling down/removing fences, destroy, pull down or remove any buildings or structures, destroy or remove any living or

³³ A ‘fire district’ means land constituted under the Fire Brigades Act 1989, in which members of the professional fire brigade respond to a fire emergency. In contrast, the Rural Fires Act constitutes ‘rural fire districts’, in which the members of the Rural Fire Service carry out rural fire services.

³⁴ NSW Rural Fire Service, *Annual Report 2001*, at 2.

³⁵ NSW Rural Fire Service, *Annual Report 2001*, at 2.

dead vegetation on any land, and establish fire breaks on any land or cause fire breaks to be established on any land (s.25). All these actions which may have an affect on the environment are subject to the principles of ecologically sustainable development. An officer may also take and use without any payment any water from any source on any land for the purposes of controlling or suppressing a fire.

Rural fire brigades, with the consent of the fire control officer for the rural fire district in which it operates, may also voluntarily cooperate with a public authority (such as the National Parks and Wildlife Service) in controlling fires.

Fire control officers are subject to any direction of the Commissioner, and are responsible for the control and co-ordination of the activities of the Rural Fire Service in the area which they are responsible for. The local authority must provide facilities and accommodation for the fire control officer. The fire control officer: supervises and directs the rural fire brigades in their rural fire district; has the right to use any fire fighting apparatus in the rural fire district (other than that controlled by the authority responsible for managed land); and must take all necessary measures for suppressing fires in the rural fire district and protecting and saving life and property in case of fire.

In terms of command structure, the Commissioner may authorise officers and members of rural fire brigades to exercise functions. Section 41 states that every person of the Police Service and all other persons are to recognise the authority of the Commissioner and any member of a rural fire brigade acting under the Commissioner's directions, and the authority of the officer in charge at a fire, incident or other emergency at which a rural fire brigade is present. It is the duty of every member of the Police Service to support the authority of the officer in charge at a fire, and to assist them in enforcing compliance with any directions given under this Act or regulation (section 41(2)). This section only applies in respect of the protection of persons from injury or death, or of property from damage, when the persons are or the property is endangered by fire or there is imminent danger of such a fire.

Part 3 of the Act provides for the co-ordination of bush fire fighting by the Commissioner. The Commissioner is to take charge of bush fire fighting operations when, in the opinion of the Commissioner: a bush fire has assumed or is likely to assume such proportions as to be incapable of control or suppression by the fire fighting authority in whose locality it is burning; or the prevailing conditions are conducive to the outbreak of a bush fire likely to assume such proportions. A fire that has been declared to be under the control of the Commissioner is referred to as a "section 44 declaration fire". The declaration generally applies to a local government area and an incident controller is appointed by the Commissioner on the recommendation of local authorities.

The Act also established a statutory body called the Bush Fire Co-ordinating Committee. The Committee is comprised of 13 members, as follows:

- Commissioner of the Rural Fire Service (Chairperson);
- An Officer of the NSW Fire Brigades nominated by the Commissioner of the Brigade;
- An Officer of the Forestry Commission, nominated by its Commissioner;
- An Officer of the National Parks and Wildlife Service nominated by its Director-General;

-
- A person recommended by the Local Government Association of NSW, appointed by the Minister;
 - A person recommended by the Shires Association of NSW, appointed by the Minister;
 - A Fire Control Officer recommended by the Rural Fire Service Association appointed by the Minister;
 - A person recommended by the Commissioner of Police, appointed by the Minister;
 - A person recommended by the Minister for the Environment, appointed by the Minister;
 - A person nominated by the Nature Conservation Council of NSW;
 - A person recommended by the NSW Farmers Association, appointed by the Minister;
 - An Officer of the Department of Community Services nominated by the Minister for Community Services;
 - An Officer of the Department of Land and Water Conservation nominated by the Director-General of that Department.

The Bush Fire Co-ordinating Committee is responsible for: planning in relation to bush fire prevention and co-ordinated bush fire fighting; and advising the Commissioner on bush fire prevention, mitigation and co-ordinated bush fire suppression (section 48).

The Commissioner is not subject to the control and direction of the Bush Fire Coordinating Committee in exercising his functions, but must take into consideration any relevant bush fire management plan and, in the case of managed land³⁶, any relevant plan of the authority responsible for the managed land.

The Co-ordinating Committee must constitute a Bush Fire Management Committee for the whole of the area of any local authority for which a rural fire district is constituted. Each Management Committee must prepare and submit to the Co-ordinating Committee a draft plan of operations and a bush fire risk management plan. The bush fire risk management plan is to be prepared within 12 months after the constitution of the Management Committee, and then within each successive five year period. The plan of operations must be prepared each two years following the constitution of the Committee.

The draft plan of operations sets out the procedures to be followed if a bush fire breaks out in the rural fire district and assumes or is likely to assume such proportions to be incapable of suppression by the fire fighting authority in that part of the State. The draft plans are submitted to the Bush Fire Co-ordinating Committee for approval.

The bush fire risk management plan is to set out schemes for the reduction of bush fire hazards, and may impose functions on the Commissioner, the Fire Brigade, State Forests, the National Parks and Wildlife Service, or any other person associated with the prevention, mitigation or suppression of bush fires. The Commissioner may exercise the functions of the management committee if it has failed to submit a draft bush fire management plan or has

³⁶ Managed land is defined in the Act as land vested in the: Forestry Act; National Parks and Wildlife Act; State Rail Authority or Rail Infrastructure Corporation; land within the catchment of a water authority; or as prescribed by the regulations.

submitted an inadequate plan.

One aim of the bushfire risk management plan is to identify the level of bushfire risk across the management area, and the strategies which need to be implemented by the responsible land managers to manage those risks. The plans include bushfire hazard maps that identify those areas of low, moderate and high bushfire hazard based on vegetation and slope.³⁷

Each Bush Fire Management Committee must develop a draft bush fire risk management plan, and invite submissions. After considering submissions received the Committee may or may not amend the plan, and then submit it to the Bush Fire Co-ordinating Committee. The Co-ordinating Committee may then either approve the draft plan or amend it.

As noted in this paper, the emphasis in bushfire prevention has moved from one of fuel management to risk management, and this is reflected in the Act and the formulation of bushfire risk management plans. Currently risk management focuses on a zoning system that identifies four major zones. These are:³⁸

- Asset protection zones – the purpose of this zone is to provide an area of active fuel reduction, the objective of which is the protection of life, property and highly valued public assets.
- Strategic fire advantage zones – these zones are designed to provide strategic areas of fire protection which will reduce the speed and intensity of bushfires, and reduce the potential for spotting. The width of the zone will vary depending on topography, aspect, spotting propensity and location of adjacent fire breaks. Fuel should be managed within minimal fire regimes for biodiversity conservation and the protection of life and property.
- Land management zones – the intention of these zones is to meet land management objectives where asset protection or strategic advantage zones are not appropriate. This will include heritage zones, silvicultural zones and rural zones. Examples include the management of fire regimes for biodiversity outcomes, post logging burns and fire breaks around rural properties to prevent fire moving into grazing or crop land.
- Fire exclusion zones – this may include areas necessary for protection for commercial or biodiversity reasons, such as rainforest areas.

Also identified are the following areas of risk management:

- Fuel management – still an important element of the risk management approach;
- Vulnerability management – this seeks to develop strategies which aim to reduce the impact of a bushfire on assets by increasing the ability of the assets to withstand and recover from fire. Vulnerability management includes strategies for: community education; emergency evacuation; building works and construction standards; and risk

³⁷ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001, at 4.

³⁸ Douglas, G “Bushfire risk management planning: A new name for an old toy or will it help biodiversity?” in *Australian Bushfire Conference*, Albury July 1999.

avoidance - for example, preventing the subdivision of land in known bushfire prone areas.

- Ignition management – which aims to reduce the frequency of bushfires (where this is a problem), recognising natural sources of ignition and modifying previous human induced ignition patterns.
- Residual risk – in managing this risk, communities require: normal fire suppression activities; response planning; detection arrangements; and extending the bushfire danger periods.³⁹

It is also noteworthy that the Act requires the Bushfire Co-ordinating Committee and the Bushfire Management Committees to have regard to the principles of ecologically sustainable development in carrying out any bushfire management activities which may affect the environment. R. Conroy of the NSW National Parks and Wildlife Service states that approving authorities must ensure that the environmental impacts are mitigated in undertaking or permitting fire prevention activities (such as prescribed burns; clearing of fuel; or fire trail construction; and wildfire suppression activities such as the use of fire retardant and foam and the construction of wildfire control lines). Reasonable alternatives must also be examined, and wherever possible the negative impacts of the activity should be reversible.⁴⁰

Conroy notes that some Local Environment Plans state that clearing for bushfire hazard reduction requires consent from the local council. A development application then needs to be lodged and consent granted before work can start. Bushfire management works are not classified as designated developments and therefore do not automatically require the production of an environmental impact statement. A private individual undertaking a fire management activity such as hazard reduction, which does not require consent or does not trigger any requirement for an approval, is then not bound by any requirements to undertake an environmental assessment.⁴¹

However, the vast majority of hazard reduction work undertaken by public authorities is covered by provisions of Part V of the *Environmental Planning and Assessment Act 1979*, which requires some form of environmental assessment. For example, the basic principle followed by the National Parks and Wildlife Service is that all proposed activities should have an appropriate level of environmental impact assessment. This may range from: a preliminary assessment aimed at identifying whether any impact issues exist (step 1); an assessment (review of environmental factors) of the significance of any impact issues that have been identified (step 2); the preparation of an environmental impact statement for

³⁹ Douglas, G "Bushfire risk management planning: A new name for an old toy or will it help biodiversity?" in *Australian Bushfire Conference*, Albury July 1999.

⁴⁰ Conroy, R. "Assessing the Environmental Impacts of Bushfire Management Works." In *Protecting the Environment, Land, Life and Property. Bushfire Management Conference Proceedings*. Sydney 276-28 February 1998, Nature Conservation Council, at 43.

⁴¹ Conroy, R. "Assessing the Environmental Impacts of Bushfire Management Works." In *Protecting the Environment, Land, Life and Property. Bushfire Management Conference Proceedings*. Sydney 276-28 February 1998, Nature Conservation Council, at 44.

significant impact issues (step 3).⁴² As noted later in this Paper, it is the necessity of these environmental assessments that have attracted criticism from some sections of the bushfire fighting community.

Part 4 of the Act deals with bush fire prevention. Section 63 places a duty on public authorities and owners and occupiers of land to prevent bush fires. The Act provides for the carrying out of bush fire hazard reduction work on unoccupied Crown land and managed land. A local authority may also issue a notice requiring an occupier or owner of land (not being a public authority) to carry out bush fire hazard reduction work. This is most likely to occur when a bushfire risk management plan identifies the need to remove a hazard, for example to maintain an asset protection zone. The Act defines hazard reduction work to mean: “the establishment or maintenance of fire breaks on land, and the controlled application of appropriate fire regimes or other means for the reduction or modification of available fuels within a predetermined area to mitigate against the spread of a bush fire; but does not include construction of a track, trail or road.”

G. Douglas of the Rural Fire Service poses some interesting questions in regard to a local council issuing an order for hazard reduction work to take place. It is unclear for instance who is required to undertake the necessary environmental assessment before hazard reduction work takes place – is it the council issuing the order or is it the landholder? He notes that this is a crucial question because the cost burden and capacity to ascertain the likely presence of threatened species for example can be considerable.⁴³

In the period 2000-2001 the Service reported that 589,319 hectares of land were subjected to prescribed burning or other fuel reduction processes during the year. This was a 24 percent increase over the previous 12 months. The Service noted that the increase in prescribed bush fire hazard reduction work reflected two things: favourable meteorological conditions; and a greater commitment on the part of land management agencies, fire services and the broader community, to the reduction of bush fire hazards.⁴⁴

The Act also includes provisions for damage by fire to dividing fences. For instance, an owner who has cleared land on their side of a dividing fence of all combustible matter for a distance of six metres may require, by written notice, the adjoining owner on the other side of the fence to repair or restore the fence if it is damaged by bushfire caused by the failure of the adjoining owner to clear their land to six metres. The adjoining owner to whom the notice has been given must repair or restore the dividing fence at that owner’s expense. However, this section does not apply to an adjoining owner that is a public authority other than a local authority.

⁴² Conroy,R. “Assessing the Environmental Impacts of Bushfire Management Works.” In *Protecting the Environment, Land, Life and Property. Bushfire Management Conference Proceedings*. Sydney 276-28 February 1998, Nature Conservation Council, at 45.

⁴³ Douglas,G “Bushfire risk management planning: A new name for an old toy or will it help biodiversity?” in *Australian Bushfire Conference*, Albury July 1999.

⁴⁴ NSW Rural Fire Service, *Annual Report 2001*, at 2.

The owner or occupier of land that adjoins any unoccupied Crown land or Crown land that is not excluded or reserved under the *National Parks and Wildlife Act* may enter on the land for the purpose of undertaking bush fire hazard reduction work for not more than six metres wide along the boundary of the land (section 80).

Division four of the Act provides for the declaration of bush fire danger periods, and division five provides for fire permits and requirements. Generally bushfire danger periods are declared from the beginning of October to the end of March each year. During this period, a person who wishes to light a fire for land clearance or other purposes is required to obtain a permit, and failure to do so may attract a maximum penalty of 50 penalty units (\$5,500) or 12 months imprisonment.

The Act also states that a person who lights a fire on land for the purpose of land clearance or for burning any fire break, or in circumstances in which doing so would be likely to be dangerous to any building, is guilty of an offence unless the prescribed notice has been given. The maximum penalty is 50 penalty units (\$5,500) or 12 months imprisonment. The same offence applies for the lighting of a fire within a local government area that is in a fire district in which doing so would be likely to be dangerous to any building.

The Minister may declare a total fire ban, and if a person fails to comply a penalty of \$5,500 or 12 months sentence is prescribed. The most serious offence in the Act is that of setting fire to land or property of another person, the Crown or any public authority, or being the owner or occupier of land, permits a fire to escape. The maximum penalty is \$110,000 or a five year sentence (section 100).

Part 5 of the Act provides for the NSW Rural Fire Fighting Fund, and requires local councils, insurance companies and the State Government to contribute to the costs of rural fire brigade expenditure. The Act specifies that the Treasurer must contribute 13 percent of the amount required to the Fund, local councils are required to fund 13.3 percent, and insurance companies 73.7 percent. The Rural Fire Service budget for the year 2000-2001 exceeded \$93 million. In its submission to the Legislative Council Inquiry into the Service, it was noted:

The Rural Firefighting Fund has enjoyed spectacular growth, rising from \$20.3 million in 1990/91, to \$50.7 million in 94/95 and \$80.4 million in 1999/00... Total allocation in the first 5 year period was \$160 million rising to \$346 million in the second period, an overall increase of 116%.

The Service believes that the commitment of funding, particularly to improve the State tanker fleet, but also to acquire other firefighting equipment and protective clothing is the basic foundation on which a successful fire management enterprise is based.⁴⁵

Part 6 of the Act provides for the establishment of a Rural Fire Service Advisory Council, comprised of nine members. The Council may advise the Minister and Commissioner on any

⁴⁵ NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 34.

matter relating to the administration of rural fire services.

3.1 The Geographic Spread and Capability of the Rural Fire Service

The work of the Service is spread across the State. Responsibility is devolved to eight regional offices, each staffed by a Regional Co-ordinator, Deputy Regional Co-ordinator, Regional Planning Officer, and a Regional Assistant. Fire Control Officers are based with the local authority. Table 1 below outlines the regional offices and their brigade numbers.

Table 1 – NSW Rural Fire Service Regional Offices⁴⁶

Region	Town Office Based in	Area sq km	No of Councils	No of Fire Control Officers	No of Brigades	No of Volunteers
Castlereagh	Narrabri	95,875	18	17	377	6,919
Central	Young	84,548	20	17	500	12,000
Central East	Penrith	26,700	25	20	309	14,640
Hunter	Cessnock	39,372	14	14	248	6,394
Northern	Grafton	56,520	19	18	262	7,567
Riverina	Albury	66,000	22	15	266	8,000
Southern	Batemans Bay	50,000	13	12	202	8,863
Western	Cobar	570,000	13	7	215	3,967
Totals		989,015	144	120	2379	68,350

3.3 Auditor-General's Report 1998

The Auditor-General handed down a performance audit report, entitled *Rural Fire Service: The Coordination of Bushfire Fighting Activities*, in December 1998. The purpose of the audit was to assess whether bushfire management was conducted in an efficient and economical manner. The focus was on whether there had been improved policies, processes and procedures to rectify issues raised by the January 1994 fire emergency. The audit recognised the size and complexity of the Rural Fire Service and found that in general the model employed in NSW has worked well, particularly given the amount of cooperation required. The audit found that commendable progress had been made by the Service, in conjunction with local councils, other firefighting and stakeholder organisations, and volunteers. It also noted that the efforts of all concerned should be recognised and applauded, especially since reforms must be developed co-operatively between a number of agencies and groups.⁴⁷

The Auditor-General made several findings and 14 recommendations. Some of the key findings and recommendations were as follows.

⁴⁶ NSW Rural Fire Service, *Annual Report 2001*, at 22.

⁴⁷ NSW Auditor-General, *Performance Audit Report Rural Fire Service The Coordination of Bushfire Fighting Activities*. December 1998, at 3.

- Cooperation and stakeholder participation varies across districts;
- That the dual accountability issue for Fire Control Officers had not been resolved;
- Communications require improvement and further work – with respect to radio communications in particular;
- Aircraft have limited effectiveness in bushfire suppression;
- There is a need for adequate post fire evaluation;
- There is a duplication of resources (stations, equipment and personnel) in many areas of the state;
- There is no automatic linkage of Standards of Fire Cover (SOFC) to the resource bidding process;
- Hazard reduction strategies need improvement and greater guidance and assistance needs to be provided to local communities in this regard;
- There is an uneven distribution of trainers and assessors in NSW which has led to varying fire fighting competency levels.

The Government and Rural Fire Service have made several changes in response to the Auditor-General's report, most notably the dual accountability of Fire Control Officers. From July 1 2001 the Officers were transferred from local government employment to the control of the Rural Fire Service.

3.4 NSW Legislative Council, General Purpose Standing Committee No 5, Report on Inquiry into the NSW Rural Fire Service, June 2000.

The Committee self referred its reference to inquire and report on the adequacy of fire suppression services provided by the Rural Fire Service. Apart from the Auditor-General's Report as noted above, the Committee's review of the Service was the first since the new Act commenced. The Committee noted that there had clearly been a transformation of the Service in the last decade. It identified a move towards a more professional Service with a greater emphasis on safety. It was also acknowledged by the Committee that the Service was very responsive to the Inquiry, which pre-empted the need to make recommendations in certain areas.⁴⁸

The Legislative Council Committee made recommendations on a wide diversity of issues, including: distribution of resources; training; communications; and roles and duties of Fire Control Officers.

4.0 BUSHFIRE HAZARD REDUCTION WORKS

A recurring debate throughout the bushfire and fire ecology literature, as well as the wider community, is the effectiveness of hazard reduction burns in controlling bushfires. This

⁴⁸ NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at xv.

section of the Paper explains some of the theory behind hazard reduction burning, and notes some of the debate about the effectiveness of it as a bushfire suppression tool. Arguments over whether the environmental requirements of the Rural Fires Act have made hazard reduction burning ‘too difficult’ are also canvassed.

Leaf litter in the typical Australian dry sclerophyll forest accumulates at a rate of three to five tonnes per hectare per year. If left undisturbed for 20 years, an accumulated fuel load of up to 30 tonnes per hectare would not be unusual. Given severe fire weather conditions, a load of 15 tonnes per hectare will produce a fire of such intensity that it will be extremely difficult to control or would be uncontrollable.⁴⁹

A steady state litter fuel load is achieved when the amount of litter being dropped is balanced by the rate of decomposition, and there is no further increase in the fuel load. Fuel loads build up rapidly and then level off. However, it can take a long time to reach a steady state or equilibrium. Table 1 below shows estimates of fuel accumulation time scales for different types of forests.

Table 1: Fuel Load Accumulation Table⁵⁰

Forest Type	Time to 8 Tonnes/ha	Time to 15 Tonnes/ha	Steady State	Time to Steady State
Dry Forest (open)	2.4 yrs	7.2 yrs	18.0 t/ha	20 yrs
Dry Forest (Dense)	1.6 yrs	3.5 yrs	30.0 t/ha	29 yrs
Wet Forest (Open)	2.5 yrs	5.8 yrs	25.0 t/ha	35 yrs
Snowgum Woodland	2.1 yrs	7.0 yrs	17 t/ha	17 yrs
Alpine Ash	2.3 yrs	5.4 yrs	26 t/ha	35 yrs

Bush fire intensity is measured by the rate of energy or heat released at the fire front, and expressed in kilowatts per metre (kW/m). The power of a one bar domestic radiator is one kilowatt. If a fire is producing heat of 500 kilowatts per metre, this is the equivalent of the heat of 500 one bar domestic radiators for each metre of fire front.⁵¹

Fuel reduction burns are low intensity fires, and generate heat of around 500 kW/m. A bushfire on a hot windy day can reach an intensity of 100,000 kW/m. The intensity of a fire is related to: the amount of fuel available; how fast the fire is travelling; and the energy content of the fuel. The more fuel is available, the higher the intensity of the fire and the more damage it does. With greater intensity, there is a far greater likelihood of the fire reaching up into the tree canopy. This may then develop into a dangerous and uncontrolable crown fire, spreading rapidly by spotting with fire brands blown well ahead

⁴⁹ NSW Rural Fire Service, *Fire! The Australian Experience*, 1998.

⁵⁰ NSW Rural Fire Service, *Fire! The Australian Experience*, 1998, at 27.

⁵¹ NSW Rural Fire Service, *Fire! The Australian Experience*, 1998, at 6.

of the main fire. Cheney of the CSIRO notes that the main influence of spotting is not to increase the rate of spread of fire directly, but to enable the fire to overcome discontinuities in fuel and topography. The onset of spotting in forest fires is the key factor which causes fire suppression efforts to break down and can trap and kill fire fighters.⁵²

While it is not possible to change the weather or topography of the land, it is possible to reduce the quantity of fuel available. While heavier fuels such as fallen logs and branches will burn after a fire front has passed through, it is only the dry, fine fuels of less than 6mm diameter that will contribute significantly to fire intensity when the fire strikes.

The objective of hazard reduction work therefore is the removal of the fine dry fuels. There are a variety of fuel reduction techniques available to do this. These include the physical removal of forest litter using human and mechanical resources. However, this is usually impractical due to the large areas involved, and the damage to trees from machinery. Another method is trittering, which involves pulverising the leaf litter so that it becomes compacted and burns more slowly. Again, this is workable for small areas only. The practice of reducing fuel by clearing with rakes and removing to rubbish tips or burning in heaps also has a number of disadvantages. It results in the removal of an integral and critical segment of nutrient recycling, and removes habitats of small mammals, invertebrates and soil micro-organisms.⁵³

Noting the above problems, it is widely argued that prescribed burning is the one workable solution to reducing the amount of fuel on the ground in bushland areas. A fire control strategy is based on reducing the fine fuels before or after the fire season, using fuel reduction burns usually with a heat output of less than 500kW/m. The aim of these prescribed burns is not to prevent fires from occurring, but to reduce the intensity, rate of spread and crowning of those that do occur.⁵⁴ Cheney notes that prescribed burns also reduce the hazard of *Eucalyptus* bark acting as fire brands or spotting.⁵⁵

The Bushfire Co-ordinating Committee of NSW supports fuel reduction by prescribed burning, noting that it should be carefully planned and executed. The Committee promotes a policy of mosaic fuel reduction burns, except where the main purpose is to provide a buffer zone between the bushland and high value assets. This allows for constant provision of fauna sanctuary and provides ideal conditions under which vegetation disturbance can be

⁵² Cheney, N. "The Effectiveness of fuel reduction burning for fire management." In *Fire and Biodiversity. The Effects and Effectiveness of Fire Management*. Proceedings of the Conference held 8-9 October 1994, Footscray, Melbourne. Commonwealth Department of Environment, Sport and Territories, Biodiversity Series, Paper No 8, at 14.

⁵³ NSW Rural Fire Service, *The Burning Question. The Rationale and the Problems*. ND, at 12.

⁵⁴ NSW Rural Fire Service, *Fire! The Australian Experience*, 1998, at 28.

⁵⁵ Cheney, N. "The Effectiveness of fuel reduction burning for fire management." In *Fire and Biodiversity. The Effects and Effectiveness of Fire Management*. Proceedings of the Conference held 8-9 October 1994, Footscray, Melbourne. Commonwealth Department of Environment, Sport and Territories, Biodiversity Series, Paper No 8, at 14.

monitored.⁵⁶ As noted, under the *Rural Fires Act 1997* land managers such as government agencies, local government and private landowners have the overall responsibility for undertaking hazard reduction activities (as distinct from the Rural Fire Service itself, which may co-operate in the carrying out of hazard reduction work).

However, it is also apparent that hazard reduction burns are not the panacea that some claim them to be. For instance, a Rural Fire Service evaluation of the effectiveness of prescribed burns in the Blue Mountains found it was not an optimal area for prescribed burning. This was largely because the climate of a large proportion of the Mountains is not conducive to the achievement of successful burns. It was concluded that the overall results of the work suggest that during the study period prescribed burning was of limited effectiveness as a fire management strategy for the Blue Mountains.⁵⁷

J. Raymond of the National Parks and Wildlife Service notes that the methodology of prescribed burning to reduce fuel loads is not in question, but the amount of area burnt, the frequency of burning and the season in which it is carried out on the urban-bushland interface is. He notes that the research literature indicates that prescribed burning offers only a two to three year period of protection during those days of high fire danger.⁵⁸ In fact, the 1994 Sydney fires showed that prescribed burns even two to three years old had little effect on fire behaviour in extreme weather conditions. Raymond concluded that the reasons for doing prescribed burns were more of the 'it has always been done this way' variety rather than taking account of statistical evidence that it is not as effective as believed.⁵⁹

Raymond does not advocate the complete abandonment of prescribed burning on the urban – bushland interface, rather that a more strategic and scientific approach. In addition, because land managers need to achieve management for biodiversity and threatened species, as well as being careful not to impact on vegetation community thresholds, a change is occurring in the way bushfire impacts are being assessed. Alternative measures both in fuel mitigation and operational response need to be addressed to satisfy the issue of the protection of life and property.⁶⁰

⁵⁶ NSW Rural Fire Service, *The Burning Question. The Rationale and the Problems*. ND, at 14.

⁵⁷ James, S "Evaluation of the effectiveness of prescribed burns: a simple methodology for post-burn assessment of the achievement of fire management objectives." in *Australian Bushfire Conference*, Albury July 1999.

⁵⁸ For example, Tolhurst found that in a dry sclerophyll forest in north-central Victoria, surface litter fuels reaccumulated to pre-burn levels two to four years after a fuel reduction burn. However, bark on trees may take 15-25 years to recover to pre-burn conditions. See Tolhurst, K. "Effects of fuel reduction burning on fuel loads in a dry sclerophyll forest." In *Fire and Biodiversity. The Effects and Effectiveness of Fire Management*. Proceedings of the Conference held 8-9 October 1994, Footscray, Melbourne. Commonwealth Department of Environment, Sport and Territories, Biodiversity Series, Paper No 8, at 17.

⁵⁹ Raymond, J "The changing direction of land managers in reducing the threat from major bushfires on the urban interface of Sydney." in *Australian Bushfire Conference*, Albury July 1999.

⁶⁰ Raymond, J "The changing direction of land managers in reducing the threat from major

An alternative method outlined by Raymond is the creation of permanent breaks or fuel reduced zones behind properties. Whilst recognising that this was not a new idea in bushfire mitigation, Raymond noted the need for a more strategic and formalised approach through the Bushfire Risk Management Planning process. The areas could be maintained on a yearly or two yearly cycle through the land management authority or preferably, jointly with a community fireguard program, so that both property occupier and land manager are working towards the same goal.

Raymond argued that the other part of a strategy to protect life and property was operational management. The increased use of aircraft has assisted in fire suppression activities within the Sydney region. He argued that the infrastructure for fire suppression, principally aircraft, need to be pre-planned and in place before the fire season. This includes helipads, water points, marking of power lines, and strategy plans in place before unplanned fire events occur. In areas away from the ocean, alternative water sources need to be developed. This includes water storage tanks for helicopter use, permanent or temporary fixed wing bases for easy access and quick set up.⁶¹

Earlier in this Paper reference was made of the work of Pyne, who noted the development of the ‘Australian strategy’ of broadscale hazard reduction burning. It is evident that this approach is no longer of relevance. The current practice in regards to prescribed burning is not one of broadscale burning but one of ‘mosaic burning’. For instance, in the preparation of fire management plans Rose *et al* recognise a mosaic level at four spatial levels: regional; management zone; vegetation community; and burn patch. A strategic mosaic is developed based on the following factors: an analysis of fire behaviour potential; fire regime threshold guidelines for broad vegetation communities; location and vulnerability of community assets and fire sensitive ecological/environmental features; and naturally occurring fire mitigation factors and fire suppression options.⁶²

In evidence before the NSW Legislative Council Committee Inquiry into the Rural Fire Service, the Director of the National Parks and Wildlife Service noted the following about hazard reduction:

In recent times, we have become more sophisticated in our capacity to control hazard reduction burns, we are actually managing strategic burns at the interface where there is the greatest risk of the fire moving off the park and where we need to manage that interface in order to protect life and property and be a good neighbour. We are refining

bushfires on the urban interface of Sydney.” in *Australian Bushfire Conference*, Albury July 1999.

⁶¹ Raymond, J “The changing direction of land managers in reducing the threat from major bushfires on the urban interface of Sydney.” in *Australian Bushfire Conference*, Albury July 1999.

⁶² Rose, R et al, “The importance and application of spatial patterns in the management of fire regimes for the protection of life and property and the conservation of biodiversity.” In *Australian Bushfire Conference*, Albury July 1999.

our methodologies. We are targeting better and one of the logical outcomes of that is as we get better at it, my guess is that the total area in any particular park might become a little bit less because we are more surgical about the way we do it, but it does not reflect in any sense a lack of commitment to appropriate hazard reduction.⁶³

The 1998 Auditor-General's report noted that hazard reduction activities are being affected adversely by uncertainty over the perceived competing requirements of different environment protection legislation. It was noted that more guidance and assistance is required from expert agencies to assist local communities to fulfil their hazard reduction obligations. It was also noted that the reporting of hazard reduction has been uneven and it is difficult to determine how effective hazard reduction has been at a State level.⁶⁴ As will be noted later in this Paper, during the severe bushfires over the 2001-2002 bushfire season, there was considerable criticism that there had not been an adequate level of hazard reduction activity carried out before the summer season, and that the environmental requirements of the legislation were partly responsible for this.

Conflicting views are also apparent from within the Rural Fire Service Association⁶⁵ itself. For instance, a member of the Association gave evidence before the NSW Legislative Council Committee Inquiry into the Service and, in reference to the environmental requirements of the Act, stated:

We would be in favour of supporting the existing provisions. There are certainly implementation difficulties in terms of getting people sufficiently aware of the requirements, for example, in relation to prescribed burns. However, we see the implementation of these provisions in the Act as the inevitable way forward in this State and this country. We are committed to making them work. It is as simple as that.⁶⁶

In contrast, the President of the Association has recently written:

[there is] overwhelming support for the anecdotal view that hazard reduction has become 'too hard' so volunteers and (to a degree) salaried staff are not giving it the priority that it deserves. Why is it too hard? Simply the level of bureaucracy involved is such that there is too large a burden on volunteers and the amount of environmental legislation that needs to be coped with too extensive. People have literally 'given up'! Whilst the Association understands the need to protect our environment and its lifestyle enriching biodiversity we believe that it is time for the pendulum to swing back towards a recognition of the need for the protection of life and property to be paramount in any

⁶³ NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 110.

⁶⁴ NSW Auditor-General, *Performance Audit Report Rural Fire Service The Coordination of Bushfire Fighting Activities*. December 1998, at 66.

⁶⁵ The Association represents Rural Fire Service members, including both salaried and volunteer personnel.

⁶⁶ NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 106.

decision making process.⁶⁷

The NSW Legislative Council Committee Inquiry into the Service also received submissions and evidence that the environmental provisions of the Act are making hazard reduction burns more difficult. After considering submissions and evidence, the Committee stated in its report: “The Committee does not support any amendment to the Act that would weaken its environmental provisions.”⁶⁸

It is evident that there is considerable debate within both the scientific/fire fighting community, as well as the wider community, on the role of prescribed burning as a means to suppress bushfires. Predictably, these issues come to the fore during major bushfire events, and are covered further in this Paper within the summary of the 2001-2002 bushfire event.

4.1 The Use of Aircraft in Fighting Bushfires

Contemporary fire suppression makes extensive use of aircraft, and elements of the aviation fleet have recently caught the public’s (and politicians) attention during the 2001 – 2002 bushfire season. Tracing the history of aircraft use in bushfire fighting is interesting because it demonstrates some of the prevailing paradigms in bushfire suppression thinking.

Pyne reports that the post-WWII era saw the dissemination of improved communications, the proliferation of truck mounted pumpers, and a revival in the interest in the use of aircraft to combat bushfires. The Forests Commission of Victoria and the RAAF had operated a fire reconnaissance service since 1929, and as Pyne notes, journals and professional contacts constantly reminded Australian foresters of spectacular North American developments in aerial fire control.

Through the 1960s the advocates of suppressing bushfires through hazard reduction knew that the Australian public identified American firefighting with air tankers, and that the public wanted, partly as a matter of national pride, a fleet of Australian water bombers. However, authorities were worried that air attack was expensive, that it would consume money at the expense of rural fire brigades - ostentatiously displaying a few high tech symbols while failing to address fundamental problems. At a public seminar in 1966, Vines of the CSIRO Bushfire Section cited figures about American air attack that “immediately leads us to the conclusion, and I think it is a just one, that this multi-million [dollar] business of chemical fire fighting in the States is a monster that is generated by its own momentum. It doesn’t matter, you see, whether it is any good or not. So much money is involved that every one is happy. Don’t let this happen here.”⁶⁹

⁶⁷ Luscombe, D. [President of Rural Fire Service Association] in *Bushfire Bulletin* Vol 23 No 3, 2001, at 10.

⁶⁸ NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 106.

⁶⁹ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 359.

Thus the Australian fire community fought to ensure that aerial firefighting as per the North American model did not happen here. The fire community demonstrated how air attack could not work, and how anything other than a commitment to fuel reduction was an expensive frivolity. Instead, they proposed an alternative – aerial ignition, to conduct fuel reduction burns. With CSIRO assistance, the West Australian authorities developed a technology to deploy incendiary capsules out of planes and ignite areas for controlled burning. Soon, aerial ignition spread around the country, and is still used strategically today.

However, this use of aircraft soon led to the deployment for fire suppression, and every State developed some level of air operations. However, practitioners ensured that air attack was kept within bounds to ensure that air attack had to complement, rather than compete with, other forms of fire protection. Pyne notes that the enormous gains in suppression efficiency came from less glamorous means: better pumpers and an increase in roads – both of which improved the usefulness of brigades; by a better understanding of fire behaviour; better communications; and by combining organisation with local ingenuity.⁷⁰

The use of aircraft for fire suppression has since been the subject of debate after virtually every major fire. For instance, the NSW Legislative Assembly Select Committee on Bushfires, established after the 1994 fires, had a specific reference to investigate the use of aircraft in firefighting. The Committee recommended that the State Government request the Federal Government to establish and fund a new review of all current aerial technology suitable for use in bushfire fighting in Australia.⁷¹

The 1998 Auditor-General's report noted the expense of using aircraft in bushfire suppression, and recommended that an analysis into the effectiveness of using aircraft in rural fire fighting would be of benefit. In response, the Service noted the following:

The Rural Fire Service recognises that aircraft are an expensive resource and that they do not suppress fires on their own. Aircraft are a tool that may be used to support ground based firefighting operations and may not necessarily be required on all occasions.

Over recent years, the Rural Fire Service has incorporated aviation into its fire management practices including tasks such as reconnaissance, transport and firefighting support to ground crews. The Service has aligned its practices to world standards deployed in other Australian states and major fire fighting agencies internationally.

To ensure the effective and efficient utilisation of aircraft, the Service employs aircraft on stand-by contracts and a casual hire basis. The stand-by contracts currently provide for two fixed wing aircraft based at Scone and Goulbourn, and two medium helicopters based at Bankstown during the bush fire season. A number of other aircraft and helicopters are available to support these contract arrangements including National Parks, State Forests, NSW Police and more than 100 private operators registered in all areas of the State.

⁷⁰ Pyne, S. *Burning Bush. A Fire History of Australia*. Allen and Unwin, 1991, at 347.

⁷¹ NSW Legislative Assembly, *Report of the Select Committee on Bushfires*, November 1994, at 53.

Additionally, the Service trains a number of specialist air and ground crew personnel to support the management of aviation resources including air attack supervisors, air observers, airborne system operators, air operations managers, airbase and helibase managers and airbase operation personnel.⁷²

As noted later in this Paper, the use of heavy duty water bombing helicopters attracted considerable attention during the 2001-2002 fire season.

5.0 BUSHFIRES AND THE PLANNING SYSTEM

It was noted earlier in this Paper that especially since the 1960s, people have wanted to build their homes and holiday retreats by and within bushland areas. It is clear that under these circumstances, building standards and urban planning can contribute substantially towards the safety and protection of life and properties from bushfire hazards.

During the height of the NSW bushfire period in early 2002, it was noted that councils should do more to ensure that houses are fire resistant. For instance, it was reported that many residents in fire prone areas had chosen to upgrade their homes since the 1994 fires, but many dwellings still did not comply with Australian Standard guidelines on fire resistance.⁷³

It is widely accepted that modern planning techniques and provisions as outlined below, if implemented properly, can help reduce the hazards of bushfires to life and property. However, the fact that large parts of the urban/bush interface, both in Sydney, the Blue Mountains, and up and down the 'holiday' coasts, have had extensive areas of subdivision that are not, from a planning perspective, protected against bushfires.

In December 2001 the NSW Rural Fire Service released an updated booklet on planning for bushfire protection.⁷⁴ A key feature of the document is the linkage of bushfire hazard for a site with the implementation of appropriate bushfire related planning and development controls. The document identified five main ways of protecting life and property from bushfire. These were:⁷⁵

- The planning and implementation of bushfire hazard reduction activities such as

⁷² NSW Legislative Council, General Purpose Standing Committee No 5, *Report on Inquiry into the NSW Rural Fire Service*. Report No 6 June 2000 at 144.

⁷³ "NSW: Councils should ensure houses are fire resistant." *AAP News* 15 January 2002.

⁷⁴ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001.

⁷⁵ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001, at 1.

prescribed burning;

- Incorporation of bushfire protection measures into subdivision design and housing development;
- Incorporation of construction standards into building design;
- Ongoing maintenance of bushfire protection measures by landowners; and
- Emergency firefighting and evacuation.

Ultimately, local councils are responsible for the provision of bushfire protection, and councils can control the level of protection for new developments through the use of local environment plans and development control plans. The Rural Fire Service document forcefully states that local government should not be hesitant in placing extra development controls on developments that warrant ‘extra protection’. It also states that any departure from recommendations set out in the document is at a council’s discretion, and that in all cases, the local fire fighting authority (whether NSW Fire Brigade or Rural Fire Service) should be the ultimate arbiter of what restrictions are applicable to the situation in question.

The guidelines state that if a draft local environment plan permits development within land which is classified as bushfire-prone⁷⁶, the plan should:⁷⁷

- Provide an asset protection zone incorporating at a minimum: an inner protection area bounded by a perimeter road or reserve which circumscribes the hazard side of the land, and has a building line consistent with the incorporation of the asset protection zone within the property; and an outer protection area managed for hazard reduction, and located on the bushland side of the perimeter road.
- Contain provisions for two way access which links to the main road or fire trail network;
- Minimise the perimeter of the area of land, interfacing the hazard, which may be developed;
- Introduce controls which avoid placing inappropriate developments in hazardous areas;
- Introduce controls on the placement of combustible materials within the inner protection area.

The asset protection zones act as a buffer between the development and the hazard. The primary purpose of the zone is to ensure that a progressive reduction of bushfire fuels occurs between the bushfire hazard and any habitable structures within the development. Councils must ensure that bushfire protection measures that are essential to a development must occur on the site of the proposed development, except under the most exceptional of circumstances. It is considered unreasonable to place the burden for provision and/or maintenance of an asset protection zone onto other adjacent land management agencies or land holders. The guidelines also state that as a condition of development the council should ensure that a mechanism is established to allow for the maintenance of the asset protection zone over the life of the development. Options include a levy on property owners, body

⁷⁶ This is defined within or within 100 metres of high or medium bushfire hazards, or within or within 30 metres of low bushfire hazards.

⁷⁷ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001, at 10.

corporate schemes and covenants at the development stage.⁷⁸

The NSW Rural Fire Service document also contains guidelines for: fire trails, design and staging of subdivisions; siting of buildings in fire prone areas; construction standards for bushfire protection; and preparing for bushfires and maintenance.

5.1 Bushfire Safety and House Evacuations

As preceding sections of this Paper have shown, scores of people have perished from bushfires across Australia. However, people who die in bushfires are seldom killed by the touch of the flames. The ‘killer’ factors in bushfires are:

- Radiant heat;
- Dehydration;
- Asphyxiation.

Radiant heat is the concentrated heat source that emanates from the flames. The closer you stand to the flames, the more radiant heat reaches you. The less intense a bushfire, the less it gives out. Radiant heat reaches its peak as flames leap highest at a firefront over the period of 60 to 90 seconds, and lessen as the flames move on to fresh fuel. The killing effects of radiant heat is increased by the amount of skin exposed to it, and decreased by the amount of skin hidden.⁷⁹

Exposure to more than a few kilowatts of radiant heat causes heatstroke and death. Deaths occur when people attempt to flee from bushfires wearing only light summer clothing such as shorts and tee shirts. Protection by clothing is vital for bushfire survival. Material interrupts and deflects radiant rays of heat, but also needs to be resistant to flame and ember attack. For this reason pure wool clothing is considered best for protection. A basic heavy duty pure wool blanket, as well as a flask of water to sip and use to wet a corner of the blanket for breathing, are basic to survival in a bushfire.⁸⁰

During the bushfire events of 2001-2002, Commissioner Koperberg of the Rural Fire Service expressed disappointment that fire crews reported many people were not wearing appropriate clothing while helping to battle fires near their properties.⁸¹

An analysis of the 32 victims who died in the Ash Wednesday fires in Victoria in 1983 found three categories in which the victims had deficiencies in their response to the fire hazard.

⁷⁸ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001, at 15.

⁷⁹ Webster, J. *The Complete Bushfire Safety Book*. Random House, 2000, at 60.

⁸⁰ Webster, J. *The Complete Bushfire Safety Book*. Random House, 2000, at 60.

⁸¹ “Concerns at Unsafe Clothing, Dehydration and People on Rooftops in Bushfires”, 30 December 2001, Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/main.htm>

These were:⁸²

- Victims who recognised the real threat to their safety with enough time to save their lives, but chose an ineffectual survival strategy;
- Victims who did not recognise the real threat to their safety in time to implement an effective survival strategy; and
- Victims who were physically incapable of implementing an effective survival strategy.

Of the 13 people who died in the first category: five died attempting a late evacuation; five were caught just outside their homes (a windshift rapidly changed the direction of the fire, catching people outside of their homes); two deliberately entered the fire area to take photographs; and one was found inside his house.

Late evacuation of a house is dangerous, and staying within a house provides a much greater chance of survival than a car due to the greater protection from radiant heat. Late evacuation also has other hazards. Surviving witnesses of the Ash Wednesday fires recounted the confusion, poor visibility, loss of orientation and conditions hazardous to driving that were present before the arrival of the fire front. Evacuation is even more problematic when people do not know where the fire is, and which roads provide access to safety. The lesson to be learnt from the Ash Wednesday fires was that if a decision is made to evacuate, it must be made early to avoid being caught in the fire on the road.⁸³

The Rural Fire Service states that the decision to evacuate in the event of a major bushfire is not an easy one. It reiterated that experience from Ash Wednesday and other major fires shows that where people are in attendance and well prepared, those in dwellings are more likely to survive a bushfire.⁸⁴

The Service notes that early evacuation is a serious consideration where:

- You are not confident that your house is prepared to withstand a bushfire;
- You are worried about your children or elderly family members;
- You suspect that you or members of the household will be unable to cope with the stress of staying;
- It is safe to leave and you have a clear idea of where a safe refuge is to be found; and
- You know the destination to be safe.

The Report of the Coordinating Committee on the findings of the 1994 NSW Bushfire Coronial Inquiry noted as an example the situation in Como / Jannali, on Sydney's outskirts,

⁸² Krusel,N, Petris S, *A Study of Civilian Deaths in the 1983 Ash Wednesday Bushfires, Victoria, Australia*, December 1992, Country Fire Authority Occasional Paper No 1, at 6.

⁸³ Krusel,N, Petris S, *A Study of Civilian Deaths in the 1983 Ash Wednesday Bushfires, Victoria, Australia*, December 1992, Country Fire Authority Occasional Paper No 1, at 7.

⁸⁴ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001, at 38.

during the 1994 bushfire event:

During the period that the fires hit Como / Jannali and evacuations were under way, there appeared to be many residents confused about what to do. There was insufficient time to ascertain whether people had properly prepared homes or otherwise. All persons were told and or assisted to leave their homes.

Some 92 buildings were destroyed, many of which were at least one block back from the interface area. Evidence indicates that many of these homes caught fire hours after the main fire front passed, or were only subjected to ember attack.

Many of the homes on the interface had bushland growing up to the backs of their property with no fire protection.

Experiences in the 1994 fires indicate that in considering evacuation procedures fire controllers need to be aware of the relative degree of risk to which homes and their occupants are exposed. In particular attention needs to be given to those situations where residences directly abut bushland. If evacuation has been exercised as an option, then as soon as danger has diminished sufficiently to permit evacuees to return to their houses, such action should be facilitated to enable residents to monitor and deal with persistent ember attack.⁸⁵

The Rural Fire Service notes that you must evacuate if directed to do so by the police. And herein lies the conundrum – if a resident is well prepared for bushfire, and staying in a well prepared house is the best means of protecting it in a bushfire, criticisms have arisen that the police may still force the prepared resident to evacuate. Part of the difficulty is that during an emergency evacuation, police do not have the time (or necessarily the knowledge) to determine who is ‘bushfire prepared’. This is where ‘a community fireguard program’ can be of assistance. Possibly, those members of the community who have taken the effort to train themselves and prepare their houses for bushfires threats, as part of a community fireguard program, could be registered with the local police and not be forced to leave their properties as part of an emergency evacuation.⁸⁶

6.0 A SUMMARY OF THE BUSHFIRE EVENTS OF THE 2001-2002 BUSHFIRE SEASON

The 2001 – 2002 bushfire season began early in NSW, with hot weather in late October 2001 being responsible for bushfires across the State flaring up. By 2 November 2001 the fire threat has eased across NSW with milder weather conditions allowing firefighters to contain the majority of bushfires. With more than 50 significant bushfires being managed, only 15 of these remained listed as "going" or "being controlled".⁸⁷ However, the worst of

⁸⁵ Report of the Coordinating Committee on the Findings of the NSW Bushfire Inquiry, May 1996, at 77.

⁸⁶ NSW Rural Fire Service, *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. December 2001, at 38.

⁸⁷ See the Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/main.htm>

the season occurred over the Christmas/January holiday, as summarised below.

Monday, 24 December 2001

With more than half of New South Wales under a Total Fire Ban and significant bushfire activity occurring across the State, the NSW Rural Fire Service advised residents in bushfire-prone areas not to leave their homes unattended or ill-prepared during this dangerous period. "The threat of bushfires is very real at this present time," said Commissioner Koperberg: "If you live in a bushfire prone area, or particularly if you live in an area that is presently affected by fire, you should ensure that your property is either not left unattended or is well prepared for bushfires....At this time we have thousands of volunteer firefighters from the Rural Fire Service who are on standby to deal with the threat of fires this Christmas, even on current fires, some 400 are likely to be out battling fires on Christmas Day and Boxing Day."⁸⁸

Tuesday December 25 2001

Across the State over 70 fires were burning or commenced burning on Christmas Day. Typical high danger bushfire weather of high temperatures, low humidity and strong hot westerly winds made suppressing many of the fires extremely difficult. Fires occurred on the outskirts of Sydney at Mulgoa, Penrith, Warragamba and Kurrajong, with at least a dozen homes destroyed on the western outskirts. In addition, 17 homes at Helensburgh were destroyed. The towns of Warragamba and Silverdale became isolated, with bushfires cutting off access roads. Major roads and highways were closed to traffic, including: the Pacific Highway on the north coast; the Princess Highway on the south coast; Great Western Highway in western Sydney; and all roads south of Sydney to Wollongong. The National Parks and Wildlife Service evacuated more than 3,000 people from the Royal National Park.⁸⁹

Section 44 declared fires were burning at: Narromine / Cabonne; Wollongong / Wingecarribee; Blue Mountains; Mudgee; Shoalhaven; Cessnock; Richmond Valley / part Maclean; Kempsey; Oberon/Mulwaree; Hawkesbury; Penrith / Blacktown / Fairfield / Liverpool; Wollondilly / Campbelltown; Gosford; Singleton / Muswellbrook; Sutherland; and Grafton / Pristine Waters / Maclean / Copmanhurst.⁹⁰

Wednesday December 26 2001

Severe bushfire weather continued, with Sydney virtually surrounded by a ring of bushfires. Fires had burnt from "the mountains to the coast in six hours", prompting Rural Fire Service spokesman Cameron Wade to comment: "We don't fight this fire. We just stand back and watch." Fires continued at: Glenmore Park, near Penrith; Blaxland's Ridge, near Kurrajong;

⁸⁸ "Warning for Residents in Bushfire Prone Areas – 24 December 2001" Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/main.htm>

⁸⁹ "Bushfires destroy homes, isolate towns." In *Sydney Morning Herald*, 25 December 2001.

⁹⁰ "Bushfire updates – 26 December 2001" Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/main.htm>

Katoomba and Springwood in the Blue Mountains; on the South Coast; on the North Coast near Grafton; at Narromine in the West; and on the ACT – Queanbeyan border. Five thousands firefighters battled the flames.

Major roads continued to be cut off, and houses were destroyed at Tomerong on the South Coast. Commissioner Koperberg of the Rural Fire Service noted the severe and erratic weather, which meant it was potentially more hazardous evacuating residents than having them stay at home: “We advise residents strongly to remain with their houses if they are able-bodied, properly clad and if their house and immediate surroundings are in good condition”.⁹¹

Thursday December 27 2001

Over 100 fires stretching 700 kilometres across the State continued to burn. Arsonists were blamed for lighting most of them. Approximately 140 homes had been destroyed to date, with the most serious fire outbreaks: to the south of Sydney; western Sydney; lower Blue Mountains; and Hawkesbury areas.

The south coast tourist area of Jervis Bay and Sussex Inlet were inaccessible by road, after fire had destroyed 33 houses. The bulk of the Royal National Park was expected to be burnt out within the next 24 hours.

Friday December 28 2001

Calmer weather conditions allowed hundreds of firefighters to spend the night carrying out backburning activities at around 100 separate blazes throughout the State. No new outbreaks were reported overnight, and no further property had been lost. However deteriorating weather conditions expected over the next couple of days presented concerns. “Overnight, for the first time since the bushfire threat reached its peak on Christmas and Boxing Day, fire crews were able to at least hold their ground,” said NSW Rural Fire Service spokesman John Winter. The areas of focus were:

- In the Shoalhaven/Huskisson area on the South Coast where backburning was continuing;
- Sutherland area;
- Mt Kembla and Avon Dam;
- Blue Mountains. Two separate fires were burning. One large blaze was burning on a 20km front, and splintered into fingers as it burns through valleys. There were concerns that these fingers would reform as a firefront with worsening weather. A separate fire was also burning near Springwood and Winmalee;
- The fire burning near Spencer broke containment lines and appeared to have crossed the Hawkesbury River. However satellite imaging and infrared cameras revealed that fire crews had been able to hold the fire on the River.⁹²

⁹¹ “Thousands flee firestorm.” In *Sydney Morning Herald*, 26 December 2001.

⁹² “Firefighters Benefit From Quieter Night – Worse On The Horizon – Friday 28 December 2001.” Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/main.htm>

Noting that dozens of backburns had been lit, Rural Fire Service spokesman John Winter said: "We use backburning as much as we use water to fight fires; it is a stock-standard firefighting technique...Backburning is a tool to remove fuel immediately in the path of another fire so it literally burns itself out. ...The difficulty in using backburning is that you are lighting another fire. It becomes a precarious exercise, and stands the possibility of creating spot fires itself or even getting out of control, because a backburn is designed to burn slowly, and against the wind...We only employ backburning when the weather conditions are safe to do so, though there certainly have been situations where backburns have got out of control. In fact, it happens quite frequently because they are not small fires..."⁹³

A firebreak was also created in the Blue Mountains between Blaxland and Springwood, with a bulldozer clearing the equivalent of a two lane road behind houses.⁹⁴

The bushfires were also responsible for a thick blanket of smoke which continued to hang over Sydney. The air pollution index reached 220 - far outside the normal range of 15 to 50 and the worst recorded since the 1994 bushfires.

The Minister for Emergency Services, Hon Bob Debus MP, responded to public criticism of the Government for not making adequate preparations for the hot summer by saying hazard reduction had been increased in the past year by 20 per cent.

Commissioner Koperberg noted that of the 100 fires still burning the cause of about 40 was not accounted for. While about 150 properties - including homes, shops, factories and a school had been destroyed, more than 11,000 homes were saved. A Statewide police task force was established to investigate allegations of arson in the 40 suspicious fires. A day after inspecting damage in Sydney's west, the Prime Minister, Hon John Howard MP, pledged \$1 million from the Federal Government towards the Christmas 2001 Bushfire Relief Appeal established by the State Government to help victims of the fires. Mr Howard said the Government would also provide help under national disaster relief arrangements to assist in evacuations and provision of food, clothing and other services.⁹⁵

Saturday December 29 2001

Premier Bob Carr visited residents in the ruins of Cross Street, Warrimoo, one of the worst affected areas of bushfire devastation. Cross Street lost seven homes between Christmas Eve and Boxing Day but the efforts of its own bushfire committee and community firefighting unit saved at least another 60 houses. The Premier said: "To stand here and look at a destroyed home and think of all the dreams and hopes and the life history that has been incinerated is a very powerful and moving experience. You have got a community here that is ready to reach out and attempt to bind up these wounds." The Premier also promised to

⁹³ "Blazes on backburner as winds threaten." In *Sydney Morning Herald*, 29 December 2001.

⁹⁴ "How a bulldozer became a tree lover's best friend" In *Sydney Morning Herald*, 29 December 2001.

⁹⁵ "No rest from the firestorm." In *Sydney Morning Herald*, 28 December 2001.

consider making small grants available to householders in bushfire prone areas to allow them to buy water pumps to help drain tanks and swimming pools more rapidly during emergencies.⁹⁶

The bushfire damage up to this date was summed up as follows:

Blue mountains

20 houses lost.

“A state of emergency is in effect in the Blue Mountains after 20 houses were lost. Extensive backburning on a 20km front south of Blaxland and Glenbrook was undertaken yesterday hoping it would turn back the bushfires firefighters expect to come today. Fire crews burned a 50m wide break to save homes lining the ridge next to the Blue Mountains National Park if wind directions change. Bushfires yesterday continued to rage out of control in Glenbrook Gorge.”

Hawkesbury

14 houses lost.

“Fires continued to rage out of control near Spencer yesterday in 700ha of mostly dense bush in the Dharug National Park east of Wisemans Ferry. Heavy smoke hampered controlled burning attempts. Brigades fighting the Spencer fire were concerned it would jump the narrow part of the Hawkesbury River. Fires west of the central coast have breached containment lines twice since Christmas Day. Kurrajong Heights, Lower Portland, Ebenezer and Kurrajong remained under threat. Air water bombers were fighting a 5,000ha blaze and fires were also blazing at Grahames Creek-Wheeny Gap and Limits Hill. A state of emergency is in place.”

Western sydney

4 houses lost.

“A state of emergency exists although fires had been contained after gutting almost 15,000ha.”

Shoalhaven

40 houses lost.

“Fires have destroyed more than 1,500ha and more than 40 houses, structures and machinery. Firefighters were yesterday trying to contain fires near Wandandian and Yalwal. Flare-up of fires near Sussex Inlet and St Georges Basin. State of emergency exists.”

Southern highlands

“Large fire front was threatening houses and properties at Mittagong and Buxton. Locals were staying put to defend their homes. It is a front which had previously terrorised

⁹⁶ “A sombre walk through worst of the devastation” in *The Sun Herald*, 30 December 2001.

Warragamba. There were also concerns yesterday about blazes near Picton and Camden.”

Sutherland

27 houses lost.

“The 8,600ha Waterfall fire was still burning. The road to Bundeena was opened until midday yesterday and residents were allowed to come and go. Houses were still under threat. A small fire was troubling Helensburgh near the railway line.”

Campbelltown

39 houses lost.

“The 1,300ha Nattai fire was burning in small pockets but had been brought under control. A fire at Warragamba was also under control but only for the time being. A fire at Mt Beloon was threatening Balmoral, Hilltop, Colo Vale and properties along the Wollondilly River. It was heading towards the Hume Highway in a 25km front. State of emergency declared.”

Cessnock

“The 150ha Big Yango fire was still burning and threatening the Wollemi National Park. State of emergency declared.”

North coast

“Fires were burning 2,600ha near Caves Hill. Fire near Yamba under control as of late yesterday.”⁹⁷

Sunday 30 December 2001

Sydney experienced one of its worst days of air pollution after overnight westerly winds swept bushfire smoke from the Blue Mountains. The Environment Protection Authority air pollution index recorded the maximum reading of 237 throughout Sydney and the Illawarra region. On a normal December day, the levels are around 20 to 30, and anything above a reading of 50 is considered high.⁹⁸

On Sunday the Canadian Erickson Air-Crane Helitanker was flown from Victoria to assist in the fire fighting efforts. The helitanker is a heavy duty waterbomber, and can suck up 9000 litres of water in 45 seconds. The helitanker joined a fleet of 55 aircraft that had been waterbombing and fire spotting to date. Commissioner Koperberg was reported to have said: “The helicopter [Erikson helitanker] is not the panacea to all our problems. It will be an adjunct to our armoury.”⁹⁹ However, the helitanker (nicknamed Elvis) was soon to become a popular image of the bushfire fighting effort in the media.

⁹⁷ “The impact region by region.” in *The Sun Herald*, 30 December 2001.

⁹⁸ “Doom and gloom: pollution levels hit all-time high.” In *Sydney Morning Herald*, 31 December 2001.

⁹⁹ “Big-bellied angel that can drop a mini-monsoon.” In *The Sun Herald*, 30 December 2001.

Whilst the extreme bushfire weather predicted did not eventuate on the Sunday, firefighters and residents were still on high alert. In the Blue Mountains, backburning and fire break clearing continued.¹⁰⁰ Over 7000 personnel and 66 aircraft were fighting the bushfires, with 250,000 hectares burnt to date. The total firefront was 600 kilometres.¹⁰¹

The NSW Opposition Leader Kerry Chikarovski called for a Parliamentary inquiry into the bushfires, stating that a similar inquiry after the 1994 fires made suggestions and recommendations for change. Emergency Services Minister Debus did not reject the idea outright, but noted the recent Legislative Council inquiry into the Rural Fire Service, and questioned the timing of the call for an inquiry.¹⁰²

Tuesday 1 January 2002

Hot and windy conditions continued, with relative humidity down to five percent, creating exceptionally difficult conditions for fire fighters. By 1 January 2002, 66 fires were burning across 367,000 hectares, and the live fire front had doubled from 630 km to greater than 1300 km. The total area burnt out had increased to 500,000 hectares. Commissioner Koperberg was quoted as saying: "In terms of a weather pattern that sustains fire of this magnitude, I have never seen anything like it in my 32 years of service."¹⁰³

On Tuesday a major fire broke out on the north-shore area of Sydney in Pennant Hills Park. Surrounded by homes on all sides, major fire fighting resources were brought in to help protect property. Resources included 27 Rural Fire Service tankers, 22 NSW Fire Brigades pumpers, and three aircraft, including the Erikson helitanker. The Rural Fire Service Assistant Commissioner Mark Crossweller noted: "The whole co-ordination and use of helicopters, including the Air-Crane, has played a major factor in securing properties from burning".¹⁰⁴

Commissioner Koperberg provided a summary of the fires across the State as follows: "Most of the fires have broken their containment lines. Only Sutherland, the Blue Mountains and parts of Cessnock have held. The fires at Nattai, Avon dam, Shoalhaven, Hawkesbury and Spencer have all broken. And there is a horrendous fire in Pennant Hills Park which is threatening homes."¹⁰⁵ The Commissioner was reported as being on the verge of calling for more interstate reinforcements, and already more firefighters, appliances and aircraft were being used compared to the 1994 fires.

¹⁰⁰ "Reprieve as dreaded high winds fail to blow." In *Sydney Morning Herald*, 31 December 2001.

¹⁰¹ "Today's summary" *Sydney Morning Herald*, 31 December 2001.

¹⁰² "We need answers but we are not trying to lay blame" *Sydney Morning Herald*, 31 December 2001.

¹⁰³ "Inferno on the city's doorstep." *Sydney Morning Herald*, 2 January 2002.

¹⁰⁴ "Super chopper saves up to 300 homes." *Sydney Morning Herald*, 2 January 2002.

¹⁰⁵ "Inferno on the city's doorstep." *Sydney Morning Herald*, 2 January 2002.

Debate about the effort and acreage of pre-fire season hazard reduction burning grew more intense as the bushfires continued. Commissioner Koperberg was quoted as saying: "There is a lot of hysteria about hazard reduction. It is always an emotive issue but the suggestion emanating that the Government does not subscribe to hazard reduction is wrong...Conversely, we don't just burn anything. We are not about scorched earth policy; you don't want to get to a point where every square inch of bush in NSW is burned every couple of years. ... There is no denying that hazard reduction, in the right place, will retard the speed of the fire in most normal conditions." However, the Commissioner noted that the fires had been sparked by abnormal conditions, and that no amount of hazard reduction could have stopped them: "I've seen hazard-reduced areas where the fires have simply carried through. I mean, fires even leapt Warragamba Dam."¹⁰⁶

However, the Commissioner noted that consideration was being given to ways of streamlining decision making by the 120 Bushfire Management Committees across the State to avoid blockages: "The Government position is that if people propose hazard reduction and find it frustrated [by] the committee system then we will look at those blockages."¹⁰⁷

Wednesday 2 January 2002.

Hot westerly winds and high temperatures again made fire suppression difficult. More than 500 people in the lower Blue Mountains and North Richmond areas were evacuated as winds continued to whip up fires and push them towards homes.

A massive fire swept through Sussex Inlet, 250 kilometres south of Sydney near Jervis Bay, destroying up to 12 houses and blocking the only road out. About 5000 tourists and residents fled houses and huddled on a point, trapped between two national parks and the sea. There were fears that the fire could turn and head toward Jervis Bay to the north. Commissioner Phil Koperberg said the fierce winds were largely responsible for the destruction, and that reinforcements had also been held up by road closures caused by other fires to the south: "We have got reinforcements in from the north but they're experiencing firestorm conditions, the situation is very, very intense...All of the 75 aircraft dedicated to the firefighting effort statewide were fully committed to protecting property elsewhere."¹⁰⁸ After inspecting properties near Marsfield in Sydney's north, the Prime Minister and Premier discussed purchasing up to four of the Erickson helitankers, at \$15 million each.

Mr Carr noted that the past 48 hours had provided an unexpected opportunity to test the helitankers, and they had proved invaluable. Commissioner Koperberg welcomed the suggestions, but noted that the helitankers are not a panacea for all evils, adding "It is good for responding to the worst of the crises and then moving on to the next. It doesn't put out fires."¹⁰⁹

¹⁰⁶ "Koperberg dismisses burn-off hysteria" *Sydney Morning Herald*, 1 January 2002.

¹⁰⁷ "Koperberg dismisses burn-off hysteria" *Sydney Morning Herald*, 1 January 2002.

¹⁰⁸ "5000 holidaymakers flee inferno" *Sydney Morning Herald*, 3 January 2002.

¹⁰⁹ "They work marvels but water bombers still under review" *Sydney Morning Herald*, 3 January 2002.

Thursday 3 January 2002

The *Sydney Morning Herald* provided the following summary for Thursday:

South coast: "Sussex Inlet area still under threat. South-westerly winds could push the fire towards Hyams Beach and Jervis Bay. A number of residents and campers fleeing. Some of the 5,000 residents and tourists were allowed back home today, others are spending a second night at the local RSL and bowls clubs. Estimated 12 to 20 homes destroyed."

Hawkesbury: "Kurrajong Heights fire still burning and a number of residents had evacuated the area themselves. Winds were picking up in the Blue Mountains but properties were not in direct danger at this stage."

Around Sydney: "New fires broken out behind Jackson Crescent, Pennant Hills. No evacuations. Fire around Pennant Hills and West Pymble on Sydney's north shore within containment lines."

Blue mountains: "A 60 km firefront burning from Glenbrook in the Blue Mountains down to Mittagong, south of Sydney impacted on Woodford late tonight. Residents of two streets were evacuated but most chose to stay and fight the fire."¹¹⁰

As the leased helitanker 'Elvis' was soon due to be returned to the Victorian Government, and upon Commissioner Koperberg's request, the State Government agreed to lease two more helitankers from the United States for a ten week period. It would take several days for the new helitankers to arrive.¹¹¹

Friday 4 January 2002

Milder weather conditions gave firefighters a reprieve to backburn and reinforce containment lines but they warned an end to the crisis was not in sight. Extensive backburning took place all day, focusing on hotspots around the Blue Mountains, particularly between Woodford and Wentworth Falls, the Hawkesbury region and Shoalhaven, on the NSW south coast.

Noting that it was 13 days since the bushfires broke out, Emergency Services Minister Debus said it was now the most widespread fire event to ever occur in Australia: "In [the fires of] January 1994 ... there began to be some rain at least in some places on day seven". He continued "On day 13 in this present event, we have not even the prospect of rain for a number of days yet." With 24 people caught lighting fires so far during the emergency, calls emerged for an arsonist register similar to that for paedophiles. Premier Carr, touring the Hunter Valley area, indicated his support for an arsonist register.¹¹²

¹¹⁰ "Overview on NSW bushfires" *Sydney Morning Herald*, 4 January 2002.

¹¹¹ "Super choppers to the rescue" *Sydney Morning Herald*, 4 January 2002.

¹¹² "Milder weather gives reprieve, but crisis nowhere near end." *Sydney Morning Herald*, 5 January 2002.

As the bushfires continued it became increasingly apparent that the impact of the fires was not just confined to the loss of property and burnt out bushland. Tourism in the Shoalhaven area, the scene of several massive fires, was especially hard hit. A Shoalhaven Councillor noted that the fires were the worst in 60 years, and that tourists were either choosing to leave the area or forced out by bushfires. The bankruptcy of businesses was foreshadowed, especially as the tourism sector relied on the Christmas / New Year summer season to sustain it during the winter.¹¹³

Saturday 5 January 2002

The hot spots for the State were reported as:

Hawkesbury/Spencer: “Westerly winds could send a blaze towards the township of Bowen Mountain today or tomorrow.”

Blue Mountains: “Massive backburning, 70 per cent complete, between Woodford and Wentworth Falls, to halt a huge front.”

Shoalhaven: “The next 12 hours are critical to the safety of Jervis Bay and Sussex Inlet.”

Southern highlands: “A 60km front is currently contained but could become volatile in gusty conditions.”

Eurobodalla: “Remains a danger for at least today. Firebreaks are being hurriedly constructed.”¹¹⁴

To encourage volunteers still fighting more than 80 fires across the State, Premier Carr said the Government would consider introducing legislation that protected their regular jobs. The Premier also urged employers to continue supporting workers who had volunteered to fight the bushfires: “I understand the problems of small operations...but I want to appeal to big employers to make sure that these volunteers have got the time off with pay to do the job for the community that they are doing...They're saving the economy, they're saving the community and we've all got an interest in them staying on the job with support from their employers.”¹¹⁵

Sunday 6 January 2002

Blue Mountains firefighters completed a 140-kilometre fire break in preparation for a continuation of severe bushfire weather conditions. The fire break, developed since Boxing Day, connected Glenbrook and Wentworth Falls and was created to prevent the large fire front still burning in the southern parts of the Blue Mountains from crossing the Great

¹¹³ “Outlook grim for tourists, locals as flames lick at resort towns” *Sydney Morning Herald*, 4 January 2002.

¹¹⁴ “The hot spots” *The Sun Herald*, 6 January 2002.

¹¹⁵ “Carr: We'll save jobs of heroes” *The Sun Herald*, 6 January 2002.

Western Highway. The NSW Rural Fire Service heralded the enormous break as one of the great achievements of the firefighting campaign. Containment lines were cleared with both manual equipment and bulldozers and bobcats. The fires had burnt out more than a fifth of the Blue Mountains World Heritage area. A National Parks and Wildlife Service spokeswoman said 122,000 hectares had been burnt out at the Blue Mountains National Park alone. Another 28,000 hectares burned in the Nattai National Park, 65,000 hectares from Wollemi, 630 hectares at Thirlmere, 7000 at Yengo National Park and 1151 hectares at Kanangra Boyd.¹¹⁶

Monday 7 January 2002

High temperatures and hot westerly winds again created fire storm conditions in parts of the State. 1400 people were evacuated from South Coast towns and flames raced towards the holiday hamlet of Mollymook. The evacuations were the largest number since last Wednesday, when 5000 were moved out of the Blue Mountains. Commissioner Koperberg was at a caravan park at Berrara, south of Sussex Inlet, when the fire front passed through. He was reported as saying: "The sun was completely obliterated. Trees were at an angle of about 18 degrees, the winds were around 90kmh and the fire was a storm of flames. It was just incredible...Everything was only two colours: red and black...It was eerie, like being in a snowstorm, the amount of debris flying around...We're standing at this caravan park, spot fires all around us, like a scene from *Mad Max* or God knows what. Visibility was zip. And out of the black clouds emerged these helicopters...It was like an apocalypse - that's the best way to describe it." The Commissioner said the Erickson Air-Crane, accompanied by three other water-bombing helicopters, worked in almost zero visibility "doing the most incredible things".¹¹⁷

While the first rain for a fortnight lowered or eliminated the threat in the Blue Mountains and the Illawarra, firefighters in the Shoalhaven faced 75kmh winds that caused one light plane to crash and the grounding of water-bombing aircraft. The 85 other fires still burning throughout the State were not threatening property.¹¹⁸

The two Erickson water-bombing helitankers ordered by the State Government from the United States arrived. This time nicknamed "Georgia Peach" and "The Incredible Hulk", the helitankers were to relieve "Elvis" which was due to return to Victoria, and also relieve some of the other 70 aircraft which had been participating in the firefighting efforts. The State Government was leasing the aircraft from the US Erickson company for more than \$20,000 each a day. Commissioner Koperberg noted that the fire season was far from over and the aircraft were needed.¹¹⁹

¹¹⁶ "Hopes pinned on giant forest-clearing effort" *Sydney Morning Herald*, 7 January 2002.

¹¹⁷ "Visions of Mad Max as fire boss gets a first-hand view of apocalypse" *Sydney Morning Herald*, 9 January 2002.

¹¹⁸ "High winds spark new crisis" *Sydney Morning Herald*, 8 January 2002.

¹¹⁹ "Giant water bombers ready to hit front line" *Sydney Morning Herald*, 8 January 2002.

Tuesday 8 January 2002

With more than 80 fires still burning, the Rural Fire Service continued to patrol burnt out areas and monitor flare ups with fears the dry conditions could cause a new crisis. The Shoalhaven remained the focus of firefighting efforts, where the two new helitankers, as well as 'Elvis' and ten small water-bombing aircraft were supporting up to 400 firefighters in the area. The fires continued to threaten property and caused evacuations from the Fishermans Paradise area to Milton showground. The Princes Highway was opened and closed throughout the day between Conjola and Sussex Inlet. It was reopened late that night, and drivers allowed through with a police escort.

Two other fires in the state remained out of control: the Deua National Park fire in the Eurobodalla shire and the Yengo National Park fire west of Cessnock. The Bulga fire near Singleton and the Nattai fires south-west of Sydney were partly contained.

As fires could smoulder for weeks in tree roots, regardless of rain, then flare in dry conditions, Commissioner Koperberg noted that the massive task of checking every fire scene would begin: "Every single tree within a kilometre of the fire reach, every bit of burning bush, twig, branch, whatever has to be firstly detected and then ... ground crews or water bombing aircraft have to be sent to that to ensure it is completely suppressed."¹²⁰

The *Sydney Morning Herald* summarised the bushfires as follows:

Land burnt: More than 570,000ha

Total fire perimeter: More than 3270km

Fires burning: More than 80

Biggest threats**Shoalhaven**

"Fire turned north-east by winds of up to 50kmh towards an area west of Bandalong. Two new helitankers, Georgia Peach and The Incredible Hulk, arrived late afternoon to support Elvis. Residents allowed back to Berrara, Lake Conjola, Conjola Park and Cudmirrah. Last night, up to 400 residents were allowed back to Fishermans Paradise. Princes Highway closed again mid-afternoon from Sussex Inlet Road to Conjola. Restricted access to Princes Highway between Sussex Inlet Road and Conjola last night."

Eurobodalla

"Uncontained last night. Fires active in hills west of Moruya. Firefighters working to hold firebreaks on eastern front. Concern that dry, gusty winds may force crews to abandon fire lines."

Orange region

"Fire in Cabonne area - started by lightning strikes five kilometres east of Mount Canobolas - contained last night. More than 200 firefighters on duty. More than 200ha burnt out."

¹²⁰

"Hot shot: the new face of destruction" *Sydney Morning Herald*, 9 January 2002.

Cessnock/Wyong and Bulga/Martindale

“Fire in the Yengo National Park, near Cessnock, remained uncontrolled last night, posing a threat to properties south and west of Boree and Hunter area. Efforts to join that fire with the Bulga fire, in the Singleton region, continued.”

Other fires

Blue Mountains

“Mopping up under way last night, with hotspots under observation.”

Wollongong

“Concern that Appin Road fire could spread to properties at Bulli Tops yesterday due to southerly winds, dry conditions and temperatures in the low 30s.”

Oberon/Mulwaree

“Fires still active, but being controlled last night”.¹²¹

Wednesday 9 January 2002

The Rural Fire Service warned that the bushfire crisis was not over and crucial containment work needed to be completed as soon as possible in preparation for worsening weather conditions: "We are not out of the danger zone as far as fires are concerned yet". Strong westerly winds and high temperatures were expected to cause problems in coming days.

With 80 fires still burning in the State, approximately 80 per cent of them were within containment lines. The fire at Sussex Inlet, where residents were evacuated earlier in the week, remained of the greatest concern, along with the fire in the Appin region.¹²²

Thursday 10 January 2002

The Federal Government pledged to co-ordinate a national firefighting strategy as it signed an \$800,000 cheque for two giant helitankers leased from the US. Acting Prime Minister John Anderson toured the NSW south coast where 40 homes were lost. With three helitankers still dumping their 9,000 litre water loads on the area, Mr Anderson announced the federal government would pay for the transport costs of “Georgia Peach” and “Incredible Hulk”. All the helitankers had spent the past days supporting efforts to bring a huge 45km firefront on the south coast under control.¹²³

The Federal Government also foreshadowed plans to facilitate talks with the States on how best to implement a national aerial firefighting strategy. "We're prepared to co-ordinate a national overview of the best way to handle the matter of aerial firefighting," Mr Anderson said: "If that's a useful way forward for the states without crossing the boundaries of responsibilities, we're prepared to help in that way if it can produce better outcomes."

¹²¹ “Bushfires update” *Sydney Morning Herald*, 9 January 2002.

¹²² “Fire crisis not over - danger day tomorrow” *Sydney Morning Herald*, 10 January 2002.

¹²³ “Canberra plans national bushfire strategy” *Sydney Morning Herald*, 11 January 2002.

He said the Government was not considering the purchase of a helitanker outright but was open to all aerial machinery that would be available to all states during bushfire seasons: "We probably need to do further research on whether they are automatically the best way to go, the best deployment of resources, but basically they're the sorts of things we will look at."¹²⁴

New powers for the Rural Fire Service to remove bushfire hazards were also announced. It was reported that the Rural Fire Service Commissioner will have his power to force removal of the hazards on private properties extended to council parks and reserves, and national parks and state forests. In addition, a simple code of practice will be issued to streamline environmental assessment before bushfire committees can approve hazard reduction work. Debus was reported to have said: "What I am about is making sure that from now on there can be no ambiguity, no argument, no misconception about who has done what over hazard reduction." Koperberg said the measures would make hazard reduction easier but that he would be arguing for an increase in resources where appropriate. The Government also foreshadowed that a new state environmental planning policy will require councils to consult the Rural Fire Service on development proposals in bushfire-prone areas.¹²⁵

Wednesday, 16 January 2002

Commissioner Koperberg indicated that while the 22 day long bushfire crisis was effectively over, the work went on for volunteer firefighters. He stated: "After one of the most protracted bushfire fighting campaigns in our State's history, it is clear that the weather has finally turned in our favour, easing the pressure on firefighters who continue to contend with a number of major bushfires...While the crisis point is now passed, the work goes on for our volunteer firefighters who will continue to monitor over 3200 kilometres of fire perimeter to ensure there are no breaks outs or re-ignitions of the fires...Throughout this bushfire crisis, our volunteers have been supported by their employers giving them leave or time away from work to battle the blazes. The community is indebted to these employers for their contribution to the firefighting effort. We do seek their continued support as the work goes on for our firefighters...Most of all, we need to recognise the bravery and commitment of our volunteer Rural firefighters, other emergency services workers and our interstate colleagues. There is no better testimony to their efforts than the more than 15,000 homes saved and no lives lost despite the most horrendous of fire conditions. The community of NSW owes them a debt of gratitude which simply cannot be repaid."¹²⁶

Between Christmas and the end of January 2002, 978 fires were reported to the Rural Fire Service. They destroyed 753,000 hectares of bush and grassland and 331 homes and structures. Police investigations have found that 154 fires were started by individuals, 103 of these are classed as suspicious and 20 as accidental. The remaining 31 are still under

¹²⁴ "Canberra plans national bushfire strategy" *Sydney Morning Herald*, 11 January 2002.

¹²⁵ "Crackdown on fire hazards" *Sydney Morning Herald*, 11 January 2002.

¹²⁶ "Bushfire Crisis - Danger Has Passed – 16 January 2002" Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/main.htm>

investigation. In all, 125 people were reported for offences under the *Rural Fire Service Act* such as lighting barbecues and burning rubbish during total fire bans. Twenty-one people have been formally charged - 19 males and two females, and three male juveniles had been charged with arson.¹²⁷

On Friday 8 February 2002 a ticker tape parade was held through the streets of Sydney CBD to honour the contribution of all those who helped fight the fires over the December – January period. It was also announced that any volunteers who had lost income whilst fighting the fires would be eligible for a \$160 per day payment from the Government. In thanking the crowd of Rural Service volunteers and staff from all services which contributed, Commissioner Koperberg stated: “It is a credit to your professionalism, your tenacity, that we walk away from this campaign not only have saved so much property, but that not a single life was lost.”¹²⁸

7.0 CONCLUSION

Bushfires are an integral component of the Australian environment. However, it is apparent that the Australian community still has not come to terms as to how best to deal with them. This is indicated by the long and continuing debate about the most appropriate response to the bushfire hazard. It is evident that the operations of the Rural Fire Service and other agencies involved in bushfire control and suppression are becoming increasingly proficient. However, it is also evident that relying too much on bushfire suppression as a management tool, and complacency in the face of the bushfire hazard, can be life threatening.

¹²⁷ “Police seek serial firebugs for a decade of bushfires” *Sydney Morning Herald* 18 February 2002.

¹²⁸ “Heroes who reigned on their grand parade” *Sydney Morning Herald* 9 February 2002.

Appendix One

Chronological List of Bushfire Events in NSW since the 1950s¹²⁹

1957 - Bush fires in the Blue Mountains area driven by gale force winds destroyed 25 homes, shops, schools, churches and a hospital.

1964/65 - Major fires occurred in the Snowy Mountains, Southern Tablelands and outer metropolitan area. The Chatsbury/Bungonia fire covered 250,000ha and destroyed the village of Wingello. Three lives were lost. In March the Tumut Valley fire burnt 80,000ha.

1968/69 - Widespread damage occurred over much of the eastern part of the State. Major fires at Wollongong burnt rainforest, destroyed 33 homes and five other buildings. Fires in the lower Blue Mountains were fanned by 100km/h westerly winds and destroyed 123 buildings. Three lives were lost. 1969/70 - The Roto fire burnt some 280,000ha in a three week period.

1972/73 - The south-eastern corner of the State suffered the worst fires since 1968 with over 200,000ha burnt. The Burrinjuck fire burnt 16,000ha and was reported to have traveled 19km in three hours, denuding a hillside in its path.

1974/75 - The severest season for perhaps 30 years in the far west with 3,755,000ha burnt, 50,000 stock lost and 10,170km of fencing destroyed. 1.5 million ha were burnt in the Cobar Shire in mid-December and 340,000ha in the Balranald fire. The Moolah-Corinya fire burnt 1,117,000ha and was the largest fire put out by bush firefighters - not the weather. Its perimeter was over 1,000 km.

1976/77 - In early December, 9,000ha were burnt and three homes destroyed in Hornsby Shire, and 65,000ha were burnt in the Blue Mountains.

1977/78 - In the Blue Mountains area 49 buildings were destroyed and 54,000ha burnt. Sydney suburbs up to 60km away were showered with fall out of blackened leaves.

1978/79 - Serious fires occurred in the Southern Highlands and South West Slopes regions. Over 50,000ha were burnt, five houses were destroyed and heavy stock losses were inflicted.

1979/80 - Following severe drought conditions over most of the State, major fires were widespread. In Mudgee Shire 55,400ha were burnt and one life was lost. 9,000ha were burnt in Warringah Shire and 14 houses lost. Fires occurred in the majority of council areas within the State burning a total of over 1 million ha.

1982/83 - \$12 million worth of pine plantation was destroyed in southern NSW in a fire which burnt 25,000ha in only two and a half hours. The Grose Valley fire burnt 35,000ha.

1984/85 - This was the worst fire season for ten years in the grassed western areas of the State. On Christmas Day more than 100 fires were started by lightning strikes and 500,000ha burnt as a result. The largest fire was at Cobar in mid-January with 516,000ha burnt. During the season there were 6,000 fires State-wide, 3.5 million ha burnt, four lives lost, 40,000 stock lost and \$40 million damage.

1987/88 - Over 115,000ha were burnt in the Bethungra and Warurillah/Yanco fires with three lives lost at the Bethungra fire. Major fires also occurred in the south eastern part of

¹²⁹

Rural Fire Service, *Major Bush Fires in NSW*, Rural Fire Service Website: <http://www.bushfire.nsw.gov.au/PublicAffairs/Public%20Affairs%20Introduction.htm>

Kosciusko National Park where 65,000ha were burnt in the Park and surrounding areas.

1990/91 - In November fires raced through the council areas of Hay and Murrumbidgee, claimed nearly 200,000ha of prime grazing land, destroyed 100,000 sheep and hundreds of kilometers of fencing. Just one week later 80,000ha of land were burnt as fires claimed another 76,000 sheep and 200 cattle in Hay and Carrathool Shires. On December 23, hundreds of fires were reported across the State with eight emergency declarations made in the Hornsby, Ku-ring-gai, Cessnock, Hawkesbury, Warringah, Wollondilly, Gosford and Wyong council areas. Eight homes were lost in these fires.

1991/92 - On October 16, two lives were lost at Kenthurst in the Shire of Baulkham Hills. Emergency declarations were made for the councils of Baulkham Hills, Gosford City, Wyong Shire and Lake Macquarie. Nearly 2,500 Bush firefighters battled more than 30 blazes around the State. 14 homes were destroyed.

1993/94 - In late December 1993, a series of fires began on the north coast and in the Hunter Region. As weather conditions continued to deteriorate, fire occurrence spread from the Queensland border to Batemans Bay. In excess of 800 fires started between December 27, 1993 and January 16, 1994. Over 800,000ha were burnt. All areas affected had previously been subject to wildfires, but never before had they burnt simultaneously. Resources from across Australia and New Zealand were utilised, resulting in a firefighting effort larger than any previously experienced in the country. At the height of the exercise over 20,000 firefighters were deployed. Four lives were lost and 206 homes destroyed.