Fire management and the bush – from an ad hoc seasonal pre-occupation to 'policy centre-stage'

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Abstract

Viewed internationally, Australia's widespread fire dependent and fire prone ecosystems are unique. Appropriate fire regimes are critical to the survival of much of the nation's biodiversity, and indeed, in many ways to the very character of the Australian landscape. Rural fire, park and forest management agencies currently confront increasing urbanisation, prolonged drought and global warming, increasing strains on forested water catchments, and questions about their ability to adequately manage fire.

This paper examines:
  o Australia's recent bushfire history in the wake of an apparent increasing frequency of devastating fires;
  o The somewhat tortured path the nation is taking as it struggles, through protracted third-party Inquiries, to better come to terms with the implications of fire;
  o Related US strategic analysis, over the past several years, and the increasingly internationally recognised *mega-fire* phenomena; and
  o Developments politically and the desire, in some quarters, to want to overly simplify Australia's recent bushfire experience.

It is proposed that there is considerable scope for improving the efficiency and effectiveness of the nation's current approach to park and forest fire management. The paper also suggests that:
  o Australia currently runs the risk of spending ever-greater amounts of money on bushfire suppression, while becoming even less successful in its management of fire in the landscape than is currently the case;
  o It is time to rediscover the relationship between appropriate, year-round park and forest management and bushfires;
  o Australia urgently needs to develop a national approach to the management of growth in the rural-urban interface and a better way of sharing the risks and costs associated with fire management in interface areas;
  o With the advent of global warming it is increasingly futile to develop policies in areas ranging from water and biodiversity conservation, to urban planning, carbon sequestration, and the maintenance of key aspects of indigenous culture, without first critically analysing fire management considerations; and that
  o Fire and land management policy must continue to be underpinned by quality research.

Finally, it is suggested that there is a need for an on-going national policy dialogue to broaden the understanding among relevant policy makers and the wider community of the key issues involved, and that notwithstanding the constitutional and political difficulties; Australia urgently needs to develop a national approach to bushfire management.

Australia's Recent Bushfire Experience

These days, there are few communities in fire-prone areas of the world that believe they have achieved successful management of their forests and woodlands, and the inherent fire threat associated with them. Changes in philosophical and organisational approaches to wildland areas over the last forty years, the expansion of urban populations into the hinterland, and more recently the uncertainties associated with global warming present decision-makers with considerable dilemmas.

In many parts of Australia, the combination of topography, vegetation, and climate produce one of the most severe fire environments on earth. The bushfire threat posed each summer in these regions is potentially very serious.

Conversely, fire has been part of most of these environments for millions of years, largely shaping the composition and distribution of the native plants, animals and ecosystems that survive today. Indeed, a significant proportion of Australia's unique biota has become largely dependent on fire and the attendant variety of fire regimes for its continued existence and development.

Most bushfires (up to 90% of all ignitions in some jurisdictions) are generally known as 'first attack fires' and are suppressed quickly, burning less than 5 hectares. 'Extended first attack fires' are the next category; these fires are generally contained within the first 24 hours and burn less than 400 hectares. The remaining very small percentage of all bushfires have traditionally been known as 'campaign fires'. These fires typically define the wider community's perception of bushfire. Larger, more devastating 'campaign' forest fires appear to have become an increasing phenomenon in Australia over the past decade.

Increasingly in the wider community, fire is regarded as a part of the Australian environment with large forest fires being understood to occur periodically, both prior to and since European settlement. In northern Australia, few years pass without large areas being burnt, but these fires have a comparatively low economic impact due to the limited population density and the dispersed nature of built assets. In southern Australia however, large fires often have significant economic and social impacts. The 2002-03 and 2006-07 fire seasons in south-eastern Australia have been particularly bad, with very significant areas of forest burnt in both summers, major asset losses occurring, very high suppression costs being borne and complex incident management arrangements being required.

While there are currently no nationally agreed criteria for defining a 'major fire event' or indeed a 'significant fire year', recent major fire events in Australia would seem to include:

Year	Fire Location	Area Burnt
1993/94	Sydney/Blue Mountains/North Coast area.	800,000+ ha
1995	South-east Queensland.	333,000 ha
1997/98	Hunter/Blue Mountains/Shoalhaven area.	500,000+ha
1997/98	Caledonia River area, Gippsland Vic.	32,000 ha
2001/02	Greater Sydney area, NSW.	744,000 ha
2002	Stanthorpe/Toowoomba area, Qld.	40,000 ha
2002/03	Eastern Highlands, Victoria.	1.1 million ha
2002/03	Brindabella Ranges, Canberra ACT/NSW.	157,000+ ha
2002/03	NSW east coast including Greater Sydney.	1.46 million ha
2002/03	Arthur Pieman area, Tasmania.	100,000 ha
2005	Eyre Peninsula, SA.	145,000 ha
2006/07	Hobart	800+ ha
2006/07	Eastern Victoria.	1.1 million ha (approx.)

Do these 'major' fires represent a continuance of Australia's cyclic experience with large bushfires, at least since the arrival of the Europeans? Or is the frequency and scale of significant fires changing?

Currently in Australia most analysis of bushfire related trends is carried out by State based agencies - and in most jurisdictions there is more than one agency involved in bushfire management. Meanwhile, independent analysis of individual incidents is largely left to State-based Coroners. A Coroner's focus, despite some legislative changes in recent years, remains primarily with fatalities. Coroners, not unreasonably, have increasingly been attempting to understand the context in which fatalities under investigation have occurred, and these analyses are now sometimes extending over some years.

Before examining efforts at analysising bushfire trends in recent years it is useful to briefly examine a few of the more significant southern Australian fires:

- The 2003 Fires in Victoria

Eighty-seven fires were started by lightning in the north east of Victoria on 8 January 2003. Eight of these fires were unable to be contained and joined together to form what was then the largest fire in Victoria since the 1939 'Black Friday' bushfires (fires which saw 71 persons lose their lives). Burning for 59 days before being contained, the 2003 fires burnt over 1.1 million hectares, including 507,000 ha of State forest, 470,000 ha of national parks and 90,000 ha of freehold land. Extreme fire activity on several days during the two months the fires were burning contributed significantly to the fire spread. The fires increased from 27,000 ha on Day 8 to 230,000 ha on Day 16 and then from 465,000 ha to 880,000 ha on Day 23.

The fires destroyed 41 homes and 213 structures and killed over 13,000 head of livestock, with thousands of kilometres of fencing also being destroyed. Tragically, one fire fighter lost her life towards the end of the fires, drowning in a flash flood. The cost of fighting the Victorian bushfires has been estimated at $115 million with and additional $86 million spent on post-fire recovery operations.

The fires saw unprecedented levels of cooperation between land management and related government agencies and rural fire services, private companies, local government, and interstate and overseas based fire personnel (seeing the first deployment of North American crews to an Australian fire). The high priority accorded to the protection of assets undoubtedly reduced the losses of private structures but may have concentrated resources near private property when resources were limited elsewhere.

- The 2003 Fires in the Australian Capital Territory

On the afternoon of 8 January 2003, lightning ignited 5 fires in the Brindabella Ranges to the west of Canberra on both sides of the ACT/NSW border. None of the fires were controlled while small, hence they continued to expand and by 17 January the ACT fires had burnt about 5600 hectares and the McIntyre Hut fire in NSW was about 10,000 hectares in size. On 18 January, under extreme fire weather conditions, these fires made intense runs towards the east, joined together and burnt into the suburbs on the western urban edge of southern Canberra.

The fires burnt 157,000 hectares or 70% of the ACT, killed four people, injured 435 others, destroyed 23 commercial premises and 487 homes, including 403 urban residences in the western suburbs of Canberra, The fires affected 70km of the Canberra urban interface. The fires burnt 110,000 hectares of the ACT's national park, destroyed 10,500 hectares of commercial pine plantations and burnt 31,000 hectares of rural land. They caused at least $610 million in damage as well as significant but unquantifiable losses to the ACT's water supply, as almost all of the Cotter water catchment was severely burnt (Doogan, 2006).

- The 2006-07 Victorian Alpine Fires

On 1 December 2006, lightning ignited fires in the alpine forests of north-eastern Victoria and Gippsland. These fires burnt about 1.1 million hectares over a two month period. A significant issue associated with these fires was that 141,100 ha of forest burnt during the 2002-03 fires was reburnt only four years later. This included about 8,500 ha of alpine ash (*Eucalyptus delegatensis*) regeneration established following the 2003 bushfire in State forest, and a currently unknown, but significant area in national parks. The destruction of the regeneration from the 2003 fires will result in large scale ecological change as there is no remaining seed within these forests. (It is understood that a comprehensive analysis of these fires will be published in the near future, in the style of Wareing and Flinn (2003))

Toward a Nationwide Understanding of Bushfire

- Recent Victorian Analysis

In one of the most detailed analyses of a single fire event yet undertaken in Australia, Wareing and Flinn (2003) considered that the 2003 Victorian fires clearly demonstrated the widespread environmental, economic, cultural and social impacts that can result from a failure to control wildfires. They further pointed out that some environmental impacts, such as soil erosion and the impact of vegetations regrowth on stream flows can be long lasting. They concluded that similar bushfire conditions could occur in the following year due to the ongoing drought and that with global warming there is likely to be an increased risk for the occurrence of more frequent and severe bushfires. They also considered that the trend to urbanisation of forest areas is occurring without adequate attention to fire risk and that the contraction of the native forest industry is impacting on the ability to contain new fire outbreaks.

In the period immediately preceding the 2003 fires, and subsequently, the management of bushfires in Victoria was subjected to a significant number of external reviews. These have included:

- two by the Victorian Department of Treasury and Finance (1998 and 2000);
- one by the Victorian Auditor-General (which commenced in 2002 and reported in May 2003 on the same themes as a similar review in 1992);
- one by the Victorian Coroner ostensibly to investigate the deaths of five volunteer fire fighters at a forest fire at Linton in late 1998. Hearings commenced in May 2000, extended over 106 siting days, with the Coroner reporting (774 pages) in January, 2002;
- one by the Victorian Government that extended over several months following the 2003 fires which reported (334 pages) in October, 2003;
- one by a federal House of Representatives Committee which reported (457 pages) late in 2003;
- one by the Council of Australian Governments (COAG), which reported (415 pages) in March, 2004; and
- five separate Inquiries into a 20 ha prescribed burn that escaped in the Wilson's Promontory National Park in March 2005.

Three further bushfires Inquiries (one by State parliament, one by the Emergency Services' Commissioner and a 'Peoples Inquiry') are currently underway in Victoria!

The majority of these completed reviews identified a number of re-occurring themes which include:

- the need for an increased focus on hazard reduction on public forested land;
- better road and track access to public lands;

- more responsive budgeting arrangements for relevant agencies, that better align with the seasonal and longer term nature of bushfire management;
- achieving a better balance between prevention/mitigation and suppression programs on public land with a return to managing fire on forested land year round;
- improved 'risk management' planning for public forested land;
- 'whole-of life-cycle' management for critical firefighting assets;
- better integration of public and private land planning;
- improved building codes for bushfire-prone areas;
- improved interagency cooperation;
- more effective workforce and succession planning for fire management personnel;
- the demands being made on volunteers in terms of public land fires;
- greater training of and support for personnel fulfilling higher level positions in Incident Management Teams;
- improved performance monitoring and 'effectiveness reporting' in relation to the use of aircraft in fire management operations;
- a greater focus on the likely impacts of climate change;
- increased emphasis on bushfire related research and for improved understanding of the relationship between fire regimes and ecosystem health; and
- greater involvement of the Australian government in policy development in relation to bushfire mitigation and management.

- Recent NSW/ACT Analysis

The 2003 Canberra fires were reviewed by the two national bushfire Inquiries listed above, as well as by three Inquiries that were specifically commissioned. The ACT Government tasked Mr. Ron McLeod to inquire into the operational response to the ACT fires. He reported in August 2003, making a series of conclusions and 61 recommendations. A NSW Coroner, Carl Milovanovich, held a four day inquiry into the three NSW fires, including the McIntyre Hut fire, and released his 20 page report in September 2003. An ACT Coroner, Maria Doogan, conducted an extensive inquiry involving examination of 95 witnesses over 103 hearing days. Her 638 page report was released in December 2006 and included 67 recommendations related to fire management. Despite the significant contribution from the NSW McIntyre Hut fire to damages in the ACT, she was prevented for legal reasons from making findings or recommendations in relation to that fire.

These Inquiries identified similar thematic issues and concerns to the various Victorian reviews. The NSW Coroner found the NSW Rural Fire Service was right to contain, rather than directly attack, the fire because of RFS concerns about firefighter safety. This contradicted McLeod's and Doogan's findings that the fires may have been extinguished had they been fought more aggressively. Both McLeod and Doogan found that substantially more strategic fuel reduction burning is required on forested land and that the lack of access tracks hindered initial and indirect suppression operations. Doogan found that the heavy fuel loads in the paths of all fires resulted in greater fire intensity and greater difficulty with containment and suppression. McLeod found that the fires were not unique and were predictable given the high fuel loads and prolonged drought conditions, although not in terms of when they would occur. Doogan found that the ferocity of the firestorm was a product of the combination of extreme weather, high fuel levels, drought and limited manpower and resources available to fight the fires.

Both the McLeod and Doogan Inquiries also criticized the inadequate provision of advice to the community before and during the fires, and recommended improved responses to fires in remote forest areas, greater integration of ACT and NSW fire management programs and that the public land managers have a more active role in fire mitigation on the lands they manage. Both Inquiries also made recommendations in relation to bushfires and land planning in the urban interface zone, including improved standards for buildings in bushfire prone areas and the establishment of a fire abatement zone on the western side of the city.

- A National Perspective

Clearly, the period 1998-2004 has seen an unprecedented level of scrutiny of the management of bushfires, particularly in Victoria and the ACT/NSW (a long running Coronial Inquiry in South Australia is yet to report). Yet despite all the reports and recommendations, fundamental issues appear to remain unaddressed. Over two and a half million hectares, or over one-third of the Victoria's public land, has been burnt by wildfire since late 2002. Politically there does seem to be an increasing recognition that escalating suppression costs may, at least in part, be linked to the falling rates in the use of prescribed fire. Under media pressure in Victoria, toward the end of the 2006/07 fires however, a government spokesman suggested that "climate change" was now the main bushfire culprit.

Nationally, and as listed above, the Council of Australian Governments (COAG) initiated a *National Inquiry on Bushfire Mitigation and Management* following the 2002-03 fire season. That Inquiry reviewed reports into the 2002-03 fires as well as previous major reports "on bushfires in Australia spanning over the past 60 years". Almost concurrently in 2003, a House of Representatives Select Committee was preparing a report entitled *A Nation Charred: Inquiry into the Recent Australian Bushfires.* That report followed several months of investigations and public hearings. As far as both these Inquiries are concerned, not all their recommendations have been implemented, in part as a result of a 'disconnect' between the responsibility for overseeing the implementation of the reports and the responsibility for implementing fire management on public land.

For several reasons, not least being Australia's federal Constitutional arrangements, there has never been a comprehensive national strategic analysis of the nation's bushfire experience. The COAG Inquiry and to a lesser extent the House of Representatives report provide some national context to bushfire issues, but both suffered from either limited participation or limited scope to address fire management issues because the responsibility for fire management lies with State and Territory governments. As a result, several commentators, including the international fire specialist Stephen Pyne, expressed regret that they did not result in more significant outcomes.

In 2003 the Federal government did agree to the establishment of a Bushfire Cooperative Research Centre, which became one of 56 public-private research centres operating in Australia. The formation of the Bushfire CRC was, and remains, a major initiative of fire and land management agencies in Australia and New Zealand (the Bushfire CRC's current funding is due to expire in 2010).

Meanwhile, another key federal player, the CSIRO, together with several State and Territory governments, published a predictive climate change related report in 2005 which examined likely fire weather patterns in SE Australia and their probable impact on bushfire management.

Recent United States' Experience

Since the late 1990s, the US has been conducting a national strategic analyses to better understand why the impacts from the small percentage of all forest fires that increase dramatically in size and complexity, have been growing. Following several exceptionally large wildfires across the US in 2002, the idea of the *mega-fire* phenomenon began to crystallize. In summary, work since that time has seen *mega-fires* being defined as those few fires that exhibit fire behaviour characteristics that exceed all efforts at control, regardless of the type, kind, or number of firefighting resources deployed. These fires represent only 0.1% of all US forest fires, yet account for 95% of the area burnt and 85% of the total fire suppression costs. They often burn into the rural-urban interface zone where there are very high asset values.

Historically, very large wildfires are not unknown in the US (or in Australia for that matter). The Brookings Institution (a prestigious, Washington-based centre for public policy) notes that "Before and shortly after the turn of the last century, the record is replete with many large wildfires. However with the introduction of aggressive fire control efforts, wildfire losses diminished for several decades. Catastrophic wildfires recently have begun increasing again, with the 1994, 1996, 2000, 2002 and 2006 fire seasons standing out. Since 1998, over 200 wildfires greater than 50,000 acres (20,000 hectares) have occurred, with more than 16 large, complex, and highly destructive wildfires considered to be *mega-fires*. Five record breaking wildfires, in different States, in 2002 alone fit the category. In 2003, Southern California's fire season eclipsed the record set only one year earlier, while in 2004 Alaska's fire season burned more hectares in one season than ever previously recorded."

The 2006 fire season in the US set further historic records for wildfire activity with around 4 million hectares burned following a total of over 96,000 wildfires, while the cost of containing the 20 largest fires approached $US500M. To help place these figures in perspective, the 2000 fire season, which saw nearly 3 million hectares burnt was, at the time, regarded as the "fire year of the century". Since then, that supposed area benchmark has been exceeded in three out of the six following years.

As wildfire preparedness funding nationally had never been higher, the fact that these *mega-fires* were occurring initially perplexed analysts. Firefighting capacity had seen a significant increase since 2000 with more and better-trained firefighters, more modern equipment and improved predictive services being available. In spite of these measures five States in the west of the country have suffered their largest wildfires on record since 2000. One incident, the Biscuit Fire in Oregon (in 2002) cost over $US150 million to suppress. The 2003 Californian fires occurred in a State that spends more than $US3.1 billion per year on fire preparedness and arguably fields the largest, best equipped and trained fire force in the US, if not the world. Despite this capacity, however, in San Diego County alone, over 3,600 homes were destroyed and 22 lives were lost.

The strategic 'tracking' of this *mega-fire* phenomenon is traced to 1999. In that year the US 'General Accounting Office' issued a report on Forests and Forest Health, that stated *"The most extensive and serious problem related to the health of national forests in the interior West is the over-accumulation of vegetation, which has caused an increasing number of large, intense, uncontrollable, and catastrophically destructive wildfires."* In response, the US Forest Service released a 'Cohesive Fuels Strategy' in 2000 that used a 'trade-off' methodology to reach a recommended level of hazardous fuels reduction focusing on 'high-risk' areas, rather than 'least-cost' areas'. Subsequent initiatives included:

- The release of a report, *Managing Environment: A Report to the President in Response to the Wildfires of 2000* by the Secretaries of Agriculture and the Interior. Often cited as the 'National Fire Plan', this document laid out a series of actions to prevent large, catastrophic wildfires across agency boundaries; and

- The introduction, in 2002, by the US President of a 'Healthy Forest Initiative', and the passing by the Congress, of the 'Healthy Forest Restoration Act in 2003' which provided the basis for increased funding of $US2.7 billion over 4 years, directed at accelerated fuels treatments, improved firefighting capacity and community assistance.

In 2003, the US Forest Service began to explore some of the definitional, conceptual, and strategic implications in better managing *mega-fires*. A relationship was revealed between the presence of exceptionally large wildfires and their propensity to occur in late seral stand conditions on drier, warmer sites where these kinds of severe wildfires would normally be rare, before the advent of fire suppression. As a result of some of the insights gained from this work, the US Forest Service introduced a new post-fire review process on its lands which consisted of three phases:
- an evaluation of pre-fire changes in the landscape, both ecologically and socially;

- the traditional post-fire review that emphasized incident management from time of detection to time of control; and
- A final phase that asked reviewers to evaluate those factors that might (or might not) set the stage for the next generation's catastrophic wildfire. This third phase was designed to help guide restoration efforts so that rehabilitation work did not, inadvertently, "build" the next high consequence wildfire.

In May 2003, the Yale University's School of Forestry and Environmental Studies - Global Institute of Sustainable Forestry released a report titled *Assessing the Environmental, Social, and Economic Impacts of Wildfire*. Again, this study found that eight of the ten case study wildfires burned in areas were the historic fire regime had missed several fire return intervals, leading to a significant build-up in fuels.

In 2004, a detailed analysis of cost management issues associated with eight *mega-fires,* undertaken for the Wildland Fire Leadership Council concluded that "Land and resource management planning and wildland-interface growth behaviours were the two dimensions of the *mega-fire* management model that needed most attention by both agency and political leaders".

The Brookings Institution then commenced a four-phased project that was aimed at "better understanding and better managing the *mega-fire* phenomenon". The four phases are to:

I. develop a conceptual framework of *mega-fire*;
II. analyse operational elements of the management of these large, complex incidents;
III. focus on the condition of the land and the growth of the wildland-urban interface; and
IV. integrate relevant measures into the current planning and review processes.

The Phase I comprehensive *mega-fire* management model involves three cross disciplinary panels to examine:
- changing fire management operational capability and capacity;
- the condition of relevant lands and available fuels; and
- growth behaviours and political influences at the wildland-urban interface.

The Phase II study (Developing and Operating in a *Mega-Fire* Scenario) analysed ten *mega-fires* components. The 2005 report of this study noted that:
- most *mega-fires* occurred under the influence of drought and heavy fuel loadings directly contributed to severe fire behaviour and impeded effective fire suppression;
- most *mega-fires* occurred in areas where "passive management seemed to dominate the affected landscape"; and
- no land management plan displayed or evaluated these risks (the higher wildfire risks considered to result from passive management) in terms of firefighting viability, cost or feasibility in sustaining resource objectives.

The report concluded that the study had uncovered "what seems a significant disconnect between public land management expectations and disturbance regime realities, particularly in fire-dependent ecosystems". It observed that "the risks of overlooking or avoiding fire regime dynamics not only contribute to eventual high fire costs, losses and damages, but also imperils the management plan-based resource objectives and sometimes threatens the very communities that lobby to avoid active management in their vicinity". It also noted that *mega-fires* may indeed be both predictable and preventable, but that the rising trends in wildfire costs, losses, and damages will continue to plague the Fire Services until there is a change in how the large fire problem in the United States is viewed. Prophetically perhaps, it concluded that as the understanding of fire-dependent ecosystems is broadened, it is likely to prove that "the tactical necessity of fighting a *mega-fire* may be strong indication of a failure in managing the land".

In the US *mega-fires* are increasingly seen as presenting fire managers with a serious paradox - how do they control an uncontrollable wildfire, limit costs, and mitigate dangers when public and political pressures to "do more" only add to the costs and increase the dangers, with little or

no positive effect? While US wildland fire suppression doctrine has always attempted to match increasing wildfire threat with greater suppression force, it has become increasingly clear that there are limits to fire fighting capabilities, regardless of the funding level made available.

Bushfire Management – 'Spin' vs. Reality

In a somewhat remarkable speech, in the weeks prior to his retirement earlier this year as British Prime Minister, Tony Blair reflected on his ten years of "managing the media" or, as he also put it, "the relationship between politics, public life and the media". Mr. Blair was, from the outset, keen to portray his speech as "analysising change" and he stressed that as far as the changes that he was drawing attention to "No-one is at fault". The speech, while clearly focussed on trends in Britain, would seem to offer insights relevant, in part at least, to the western world in general, and to Australia in particular.

As far as those in public life went, Mr. Blair observed that "A vast aspect of our jobs today, outside of the really major decisions, as big as anything else, is coping with the media, its sheer scale, weight and constant hyper-activity. At points it literally overwhelms…" and "…Actually if you don't have a proper press operation nowadays it is like asking a batsman to face bodyline bowling without pads or head gear". As to its current modus operandi Mr. Blair observed that over the last decade society has seen the development of a media "that increasingly and to a dangerous degree is driven by impact. Impact is what matters…..The audience needs to be arrested, held and their emotions engaged, something that is interesting is less powerful than something that makes you angry or shocked".

The speech went on to examine the consequences of this preoccupation, suggesting that; "
- scandal or controversy beats ordinary reporting hands down;
- attacking motive is far more potent than attacking judgment;
- the fear of missing out means that today's media, more than ever before, hunts in a pack. In these modes it is like a feral beast, just tearing people and reputations to bits, but no-one dares miss out;
- commentary on the news being as, if not more, important than the news itself, leading to;
- the confusion of news and commentary; and finally that
- the final consequence of all of this is that it is rare today to find balance in the media. Things, people, issues, stories, are all black and white. Life's usual greys are almost entirely absent…"

Mr. Blair concludes this section of his talk by examining the relationship between the 'players', suggesting that "the NGOs and the pundits know that unless they are prepared to go over the top they shouldn't go out at all. Talk to any public service leader………..and they will tell you not that they don't mind the criticism, but they become totally demoralised by the completely unbalanced nature of it…"

Now if Mr. Blair is even partially correct in his analysis (and sections of the British media have certainly taken issue with aspects of his analysis) then the lot of the hard-pressed forest and fire manager in southern Australia would appear bleak. Gaining and retaining more realistic budgets for the 'back country', taking the 'informed risks' inherent in the use of prescribed fire, and keeping the inner-urban based environmental NGOs on-side in terms of the maintenance of proper fire and biodiversity relationships are but three of more significant challenges confronting the land manager. Maintaining proper and professional relationships with the media is clearly also essential.

In Stephen Pyne's most recent book (Pyne, 2006); he states that "Australia is among the world's fire powers. It has fires, fire institutions, fire scholarship, and a vigorous fire politics. Only America has invested a comparable fraction of its national culture into the subject, so what Australia has to say about fire matters far beyond its own shores."

Despite Pyne's view, the ability of 'nature management' to compete with more urban-orientated community demands is, anecdotally at least, increasingly diminished. The general absence of well developed, community based lobby groups that support active land (and fire) management may be part of the problem. Many of the community based conservation organisations are largely urban based and ambivalent, at best, to the role of fire in park or forest ecosystem management. In common with most relevant Ministers and their advisers, while possibly for different reasons, there is an apparent tendency within both groups to doubt that natural systems need active management.

Ad hoc community groups have been active following major fire events, but like so many aspects of the 'bushfire cycle' they often dissipate when the fire danger eases. Recently some advocacy groups that have a significant proportion of retired forest fire specialists have achieved more enduring support within the media (prompting, on occasions, an easy but superficial political riposte that "we can't go back to the past").

In a paper published in 2005, and titled *The Uses and Value of National Parks; Does More Mean Worse?*, former senior federal Treasury bureaucrat Jim Hoggett suggests that "Parks are the victim of the same self-defeating process affecting so many State government programs. This involves a sequence of over-ambitious governments over-promising to the public and over-committing limited budget resources. In the end, nothing is done well and band-aids are applied to the most serious wounds. Unfortunately for parks, their neglect becomes apparent only in intermittent spectacular fires and the gradual deterioration of the park lands."

In its April 2007 report (*Conserving Australia: Australia's national parks, conservation reserves and marine protected areas*), whilst noting the difficulty of obtaining definitive data, a Senate Committee suggested that in relation to its protected areas "Australia has amongst the lowest budgets and staffing levels per hectare in the developed world". The report goes on to quote a CSIRO caution in relation the creation of 'paper parks' that "do not meet conservation objectives and therefore waste money, and to avoid creating havens for feral animals, weeds and sources of fire".

Where to from here?

Under Australia's Constitution, day to day responsibility for land (and bushfire) management sits with State and Territory governments. At the national political level policy responsibility for fire management sits with several Ministerial Councils, including 'Natural Resource Management' (NRMC), 'Primary Industries' (PIMC) and the 'Australian Police Ministers' (APMC). With the exception of the provision of federal funding the bushfire mitigation programs under the APMC and the work of the 'Forest Fire Management Group'(FFMG) under the PIMC, there has been minimal bushfire related policy activity by the Ministerial Councils and their related Standing Committees. However, in March 2007 a joint sitting of the NRM and Primary Industries Standing Committees requested that work be undertaken to prepare a comprehensive paper on the future development of a forest fire management policy and research at the national level.

The Australasian Fire Authorities Council (AFAC) has, in recent years, been gradually developing a national presence, a number of now well accepted policies being perhaps the best example of this evolution. AFAC is also working closely with the FFMG to develop joint interpretative and educational publications.

AFAC's successful lobbying of the Commonwealth Government for funding support for the creation of the Bushfire CRC, and subsequently for the National Aerial Firefighting Centre has also assisted the emergence of national bushfire dialogue. The Bushfire CRC's work on community and 'interface' related research is also helping to broaden the discussion. Clearly,

however a lot more work needs to be done to achieve a 'national consensus' on strategies and approaches to forest fire management.

In March 2007, the Bushfire CRC held a one day forum in Federal parliament building specifically to address the issue *Are Big Fires Inevitable?* The forum, which was attended by around 150 invited participants and several politicians, was designed to address several themes including drought and related climate factors, the fire and water relationship, community related 'interface' issues and forest land management strategies. Support from Australia's national radio network (the ABC) facilitated reasonably widespread coverage of the forum and this was followed up with a '4 Corners' national television current affairs program that focussed on the current state of bushfire management in NSW and Victoria.

Increasingly, a number of recurring themes are emerging from the various recent State and Federal Inquiries that warrant further examination. These include:

- **Resourcing of park and forest management**

Nationally over the last 25 years more than 11 million hectares of State forest has been set aside as national park and related reserves, this change in status often resulting, for the reasons partially set out above, in less 'active' land management. The creation of new 'reserves' often, for example, sees a gradual reduction in the access track network and reduced prescribed burning levels (More often than not a key reason for this change in land status has been urban based voter concerns about timber harvesting - in Victoria for example, over half of the seven million hectares of public land was available for timber production in the mid-1970s, today this figure is around 8%). In general, governments have not increased the budgets of park agencies in anywhere near same proportion as the increase in the land estate the agencies are required to manage, and with the departure of most industries from the land in question, alternate funding sources available to land managers, such as from tourism operators, fail to meet the gap.

Similarly, over the past 30 years or so there have been significant reductions in public land management workforces, and particularly in those whose members resided close to forest areas. These crews have traditionally undertaken important roles in fire management, and particularly in the all-important 'first-attack'. Reductions in the native forest based timber industry have further reduced the equipment and skills available for forest firefighting. Quantifying this decline and the apparent deskilling in forest management workforces is difficult, due to the constant re-structuring of land management agencies, together with 'outsourcing' and an increased focus on 'policy' work by agencies, rather than operational management (The report of the recent Senate Inquiry - discussed above - does however attempt some inter-state and international bench-marking however). The existing skill shortages are being exacerbated by increasing numbers of experienced fire management personnel reaching retirement age.

Perhaps of less significance in some areas, but the amalgamation of local councils, in a number of States, and the often related 'contracting out' of tasks that previously saw heavy equipment (including earth and water moving machinery) located close to forest areas again adds to the bushfire 'first attack' challenge.

The maintenance of roads and other fire infrastructure, pest plant and animal management and the use of prescribed fire for fuel and ecosystem management are all essential components of responsible forest stewardship. Clearly, the implementation of fire management programs cannot be adequately performed without the provision of appropriate ongoing financial resources and workforces, as well as the 'political' will power to undertake the work. Forest and conservation agencies find it difficult to compete for adequate levels of year round funding, with many governments seemingly preferring 'reactive' suppression and post-fire event initiative funding, including the employment of additional seasonal fire-fighters and expanded aircraft fleets (in a number of more recent bushfire situations in southern Australia, attempts have been made to recruit base-grade fire crew personnel during active fire seasons. Such attempts have generally been severely constrained by the lack of agency personnel who can act

as crew leaders – again, a result of having too few permanent staff available with local knowledge and the essential forest fire experience).

- **The use of prescribed fire**

The role and use of prescribed fire in parks and forests is arguably the most frequently debated fire management issue, with a 'precautionary' fire management approach tending to prevail in recent decades. Experience, backed increasingly by research, has shown that the planned strategic use of fire in parks and forests can provide a degree of protection from wildfire. Some land managers are also beginning to recognise the importance fire plays in the maintenance of biodiversity in many ecosystems. In 1998, in Victoria, the then Department of Natural Resources and Environment and Parks Victoria formed a, at the time, unique partnership to; "

- assist park and forest managers to develop an improved understanding of the relationships between fire regimes and biodiversity; and
- facilitate a better integration of the fuel management strategies and the fire related ecosystem requirements of the State's public lands"

On the basis of the then Victorian data bases the State's initial approach was based on the use of plant species' 'vital attributes'. A year or so later Western Australia followed Victoria's initiative, basing its initial approach however on the 'vital attributes' of fauna.

As part of the Victorian initiative a subsequent analysis of 'disturbance' by fire on public land in that State (Department of Natural Resources and Environment, 2002) found that the major threat to species composition and vegetation community conservation on most Victorian public lands was, at that time, from under exposure to fire.

Other than the Victorian and WA initiatives however, there has been little comprehensive analysis undertaken over time on the relative changes in seral stages of Australian forest types, or on fuel and hazard accumulation across forest areas.

More generally, and notwithstanding past experience and more recent research, the areas treated with prescribed fire in most southern Australian jurisdictions have fallen considerably in recent decades (for example, see the Victorian Auditor-General's report of 2003). There are several reasons for this including: the resources and skills available to land management agencies; the dramatic growth of built assets in the urban interface; the risk adverse nature of land management agencies; and political and community attitudes to fire.

Following its largest bushfire in 60 years (in January 2003), the Victorian government committed itself to reversing the decline in the use of prescribed fire in that State. As yet however, and notwithstanding the long-running drought in south-eastern Australia, the promised turn-around is yet to materialise.

- **The extent and value of assets in the urban interface zone**

The largest loss of built assets in the urban interface zone in recent years occurred during the 2003 Canberra fires, primarily as a result of ember attack. Despite the recommendations from various Inquiries for greater use to be made of the Australian Standard for the Construction of Buildings in Bushfire Prone Areas in the urban interface area, governments seem reluctant to pursue this matter for either new or existing buildings. Instead most emphasis is placed on the establishment of "fire abatement zones" and the management of fuels on public lands in interface areas. The experience from Canberra (and in places like the Otways in Victoria, following the 1983 fires) indicates that the destroyed houses are being replaced with much higher value houses, but in general without any additional bushfire protection features.

- **The level of fire behaviour/fire weather expertise in relevant agencies**

There was considerable anecdotal and other evidence available both during the 2003 and 2007 fires in south-eastern Australia (see Tolhurst, 2007) that specialist skills in fire behaviour and fire weather were diminished among firefighters and Incident Management Teams, when compared to earlier times. This skill shortage may be retarding suppression efforts and could be adding significantly to areas burnt by wildfire. Similarly, it is possible that a combination of inadequate skills and a desire to minimise risk is a significant impediment to the conduct of prescribed burning operations.

The decision by the Victorian government, in late summer 2007, to create 600 kilometres of permanent "fire" (fuel?) breaks in heavy forest around Melbourne's water catchments was reported in the media as effectively 'saving' the city's water supply. Such reports indicate ignorance of eucalypt fire behaviour and of the reality, under certain conditions, of long distance 'spotting' causing new fires well ahead of the main fire.

- **Fire fighter safety, risk minimisation and the legal system**

There are increasing concerns within the land management community that the cumulative effect of on-going changes to occupational health and safety legislation, and the increasing involvement of the legal system in firefighting, may have moved the suppression effort 'balance' from a focus on 'safety' to one of 'risk avoidance'. In terms of bushfires, where the aim is to bring an 'out of control' situation 'under control' as quickly and as safely as possible, is this significant shift in emphasis desirable, or in the community's best interest?

This issue was raised in both the ACT and NSW Coronial Inquiries after the 2003 fires. The ACT Coroner was very critical of the decision to withdraw firefighters on the first night while the NSW Coroner defended the decision to adopt indirect rather than direct suppression tactics. Both these decisions resulted from concerns about risks to firefighter safety, but undoubtedly caused significant escalation of the fires and contributed to the inability to control them. The 2003 Victorian Bushfire Inquiry also discussed the possible negative impact on 'suppression performance' of the lengthy and somewhat adversarial Linton Coronial Inquest. It concluded "that there may have been some over-reaction to the Coroner's recommendations" but that "this is not the only issue to consider".

The 2003 COAG Bushfire Inquiry observed that "Coronial investigations into operational decisions may reinforce blame and risk avoidance, rather than improving a shared understanding and promoting a learning culture." Recently, a US Forest Service Crew Leader was charged with manslaughter, over the deaths of four firefighters in 2002. This action may have significant ramifications for firefighting in the US and possibly, in time, in Australia.

- **The escalating use of technology**

In January 2002, an 'air crane' heavy lift helicopter on summer lease to Victoria since 1997 was deployed to assist in the control of fires that were threatening Sydney. The inaugural use of the 'air crane' in Sydney dominated media coverage of the fires for several days and ultimately led the then Premier of New South Wales to remind the community that while aircraft can assist with the management of bushfires, people "on the ground" were actually required to safely and effectively contain them.

There is no doubt that technology, in many of its forms, has greatly improved the efficiency and effectiveness of bushfire management in Australia. Given the escalating cost of fire suppression, there is a need for considerable more rigour in the on-going evaluation of both the effectiveness

and efficiency of the various technologies, particularly aircraft. The Bushfire Cooperative Research Centre has undertaken some initial work in this field and the project's first research report was recently published. Key findings from this report included:
- that air operations must be effectively integrated into the incident management structure and that competent personnel need to be available to direct the operation;
- that the use of ground resources with initial aerial support is the most economically efficient approach to suppression;
- that the use of aircraft for 'first attack', until ground forces reach the fire produces the best outcome; and that
- large fixed-wing air-tankers, such as DC-10s are at a cost disadvantage. This is particularly the case for 'first attack' when fires are small and where water/retardant accuracy is critical.

- **Climate Change**

In a relatively short space of time the impact of climate change on all aspects bushfire management has moved prominently into the public domain. Last summer, and as previously detailed, at least one government spokesperson claimed that climate change, "in both Australia and the western USA, is the main driver of large fire activity in many forests and shrublands".

With much of southern Australia currently in the grip of a decade long drought, the role of underlying moisture deficits in the fluctuating nature of Australia's experience with bushfire is highlighted. Equally perhaps, international scientific opinion is firming that significant climate change is underway. The political temptation to use these two factors (drought and looming climate change) to avoid scrutiny of the on-going stewardship of the management of Australia's public lands must, at times, be considerable. Fire and land management professionals however, do not have this option.

It is actually about Land Management

There is a growing consensus emerging in North America, and more recently in Australia, that societies that largely ignore the bush ('nature') for most of the time will, in fire-prone areas, pay a re-occurring price in terms of social disruption, damaged assets, environmental degradation and, at times, loss of human life.

Reviewing international trends in fire management in 2006, the internationally based NGO 'The Nature Conservancy' suggests that far too often "There are disconnects between fire prevention programs, suppression responses to wildfires, fire use, conservation of biodiversity, and the needs and aspirations of people who use and are affected by fire" (Myers 2006).

In southern Australia at least, we would seem to be approaching a point where decisions can no longer be avoided, in terms of whether that price is worth paying. The 'evidence' increasingly seems to suggest two alternatives:
- either a fundamental change in approach that sees increased year-round budgets for our park and forest managers to allow more active land (and fire) management, and an associated commitment to rebuilding the associated human expertise and experience; or
- A decision (explicit, or implicit) that as fire-prone communities we will largely 'continue as we are', taking our chances with the ad-hoc nature of the landscape's underlying moisture deficit, and the weather.

Our final proposition today is that on the clear evidence of the last 10 – 20 years in Australia the State-based approach to forest fire management has, and will continue to fail – not so much technically, but politically. In a country of Australia's size, with its overwhelmingly urban-based population, spread across eight separate States and Territories, the bush and its 'fire

challenge' has little if any chance of sustained political and bureaucratic attention. Is there a way forward?

Think Nationally, Act Locally

Humans are currently understood to have first used fire, to manipulate the African savannas, several million years ago. The thoughtful and deliberate use of fire in North America and on the Australian continent, prior to the arrival of Europeans, is also increasingly being understood. The current dilemmas we face would, at one level, seem part of the long tradition of human adaptation to changing circumstances.

The recent US experience, in developing what is now known as the *mega-fire* phenomenon, suggests that there are three key factors relevant to responsible management of fire-prone environments viz:

- Ongoing rapid and effective suppression of all forest fires;
- More active land management, including prescribed burning (for fuel and/or biodiversity maintenance) and track maintenance, in fire dependent forests; and
- Improved planning and control of the growth of built assets in the urban interface zone.

In the wake of the large and devastating bushfires in south-eastern Australia over the past four years, and the thematic issues identified during the various reviews of these fires that have been undertaken at national and State level, clear similarities between the Australian and US situations have emerged. The need for urgent and fundamental change in Australia's approach to forest fire management is apparent. The occurrence and impact of devastating *mega-fires*, with their increasing costs to humans and the environment, can be reduced with sound, year round land management.

A truly national and genuinely rigorous trend analysis of fire management strategies and bushfire outcomes in Australia in recent years would seem overdue. As we head into a less certain world climate-wise, we need to ensure that we have appropriate national policies and strategies for the perennial management of our large, and largely fire-prone public forest estate. We also need to ensure that Australia's multi-layered urban planning system does not create the foundations for future catastrophes in the rural-urban interface zone. Similarly, it is increasingly unthinkable that public policy in areas from water and biodiversity conservation, to urban planning, carbon sequestration, and the maintenance of key aspects of indigenous culture, could be developed or reviewed without first critically analysing landscape scale fire management issues.

The establishment, three years ago, of a Bushfire Co-operative Research Centre, the 'Fire Knowledge Network', the growing policy role being played by the Australasian Fire Authorities Council, the FFMG and tentatively by relevant Ministerial Councils are positive 'first' steps in the development of a greater strategic approach, nationally, to bushfire management.

The development of meaningful national forest fire management policies and programs, in the context of climate change, would seem however to also require:

- That current key national and State fire and land management 'players' commit to the development of an on-going national policy dialogue with relevant policy makers and the wider community to achieve;
  - A heightened understanding of the central role that the management of fire in the landscape plays in a wide range of public policy areas;
  - A greater emphasis on reducing the occurrence of *mega-fires* and agreement on the importance of the essential elements of 'year-round' park and forest management; and
  - Concurrent national agreement that bushfire management involves more than 'emergency response'.

- Agreement as to the role of prescribed fire in land and ecosystem management and the development of an appropriate funding model for park and forest fire management;
- Building on the work of the 2003 COAG and Nairn reviews, using a process that includes a thorough analysis of Australia's recent fire history;
- The development of a national approach to the management of growth in the rural-urban interface including a better approach to sharing the risks and costs associated with fire management in interface areas;
- Improved understanding of the community's expectations as far as the protection of its assets, and on the role volunteers in the management of fire on public land;
- The development of a consensus in terms of how best to learn positive lessons from fire events, including the development of positive processes to routinely review events and practices leading up to major fire events; and
- The need for on-going bushfire-related research, including the monitoring of the impacts of fire management policies and strategies, and of the effective use of technology.

Conclusion

There is clearly scope to improve Australia's current approach to bushfire management. Progress however will increasingly require an evidence-based and cooperative national approach between land management and fire agencies, and politicians.

Such an approach would seem essential if we are to develop a strategic, year round focus on the increasingly important public policy issues associated with bushfire management, and if we are to make the best use of the limited human and other resources available for the task.

Acknowledgements

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