Peter Bentley
Bachelor of Applied Science (Parks Recreation and Heritage
Associate Degree (Parks Recreation and Heritage)
Diploma of Horticultural Science

Mr. Ian Dundas
Committee Secretary
House of Representatives
Select Committee on the Recent Australian Bushfires
Parliament House Canberra
ACT 2600

Dear Mr. Dundas

To introduce myself, I am a self employed consultant in the resources sector, and have been so for the past 7 years. Prior to that I have been employed in a range of state and federal government agencies with responsibilities in fire management with experience in fire management roles and suppression in three states of Australia. In addition I have previously been a member of a volunteer CFA brigade in Victoria.

A copy of my CV is available on request.

I have enclosed in hard copy and on CD copies of 3 reports plus a number of observations that relate directly to the terms of reference based on my prior experience and knowledge.

Reports

The first report is entitled *'Some Aspects of Fire History Mapping in North East Victoria'*. This work was undertaken in an area south and west of Mt Buffalo in Victoria in the summer of 2001-02.

The background to this work is explained in the report however the undertaking of this report revealed that much of Australia does not have a definitively known fire history. The use of dendrochronological techniques while not absolute in defining fire histories will provide a body of data that present a far better picture than what we have now of fire regimes.

Members of the committee may not be familiar with the techniques used in this report however they are widely used in the USA and elsewhere with fire histories in the USA dated back to 1650. Imagery used in fire scar analysis for *'Some Aspects of Fire History Mapping in North East Victoria'* is available to the committee should you wish to see and evaluate the technique

Interestingly this report shows that in some areas fire frequency has been far higher than ever previously documented and may be associated with grazing and pastoral activities. The second interesting finding is a general reduction across the landscape at about the time the Alpine National Park was declared in Victoria in the early 1980's.

There are still large areas of Victoria and interstate (South Australia) that do not have known or inferred fire histories.

The importance of establishing fire histories lies in the application of a suitable fire regime that retains and enhances biodiversity at the landscape scale. Establishment of a suitable fire regime can be undertaken by the application of the Vital Attributes model (Gill, Tolhurst et al) that is undergoing enhancement and refinement at the national level at present.

Definition of a fire history provides a staring point for the application of the Vital Attributes Model in that the time since the last fire can be determined with a reasonable degree of accuracy provided that the sampling process is adequate across the landscape.

The second report is entitled *'Fire Management for Biodiversity in Parks of South East South Australia'*. This report examines both the fire histories and vital attributes of five conservation parks in the south east of South Australia and makes recommendations for the maintenance of biodiversity amongst other things.

During the preparation of this report the work of Choate et al in South Australia was reformatted to be included in the national Vital Attributes model database. This report demonstrates the requirement of working at the landscape scale and including factorial analysis, for example, of the impacts of accumulating fuel load and changed hydrological conditions both within and without vegetated areas.

The third report entitled ***'Project Yurrebilla A Fire Risk Hazard and Threat Assessment'*** is under consideration by land management agencies in South Australia and essentially addresses the threat posed by wildfire in the Mt. Lofty Ranges of South Australia extending from the Barossa Valley in the north south to Mt Compass and up to 40 kilometers east of St Vincents Gulf.

This report has identified that many vegetated areas in the Project Yurrebilla area contain very high to extreme fuel loads (as high as 39 t/ha). The potential for loss of life and property and attendant electrical water and associated infrastructure is high under very high to extreme FDI conditions.

No doubt there are parallels with other capital cities and major regional centers in Australia including Sydney, Melbourne, Canberra and Hobart to name a few.

Further Observations

The potential for financial loss, damage to infrastructure and potentially loss of human life is historically and potentially highest on the semi rural/semi urban fringes of major capital cities and towns.

This will continue to be so with about 80% of the Australian population now residing in urban and semi rural areas.

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Land Use Planning

The over riding problem is largely derived from and compounded by land use planning decisions made years ago and in some cases many decades ago. With the perfect wisdom of hind site many residential developments should not have been allowed to proceed.

Probably worse was the aftermath of the 1983 Ash Wednesday fires where many buildings and dwellings were simply rebuilt on the same site and further development allowed, as has occurred at Lorne, Anglesea and Fairhaven in Victoria and Greenhill Road in the Mt. Lofty Ranges.

In my view there is no point in casting aspersions at local government or the fire authorities as the knowledge and techniques of defining risk, hazard and threat were simply not previously available and have only just become available in the past 2 – 3 years.

In many areas of Australia there have not been until recent times formal or legal referral processes between land use planners and fire authorities when considering land use planning and developments.

Recent advances in NSW between fire authorities and local government go some way to resolving the problems experienced in the past. The inherent difficulty is in the assessment of how successful these measures will be in NSW as major fire events may occur in 20 – 50 year cycles.

The Project Yurrebilla report (copy enclosed) seeks to provide a methodology that can be replicated anywhere in Australia that can quantify risk of ignition and fuel hazard allowing an empirical model to define wildfire threat in a given location.

The other difficulty that local government and fire agencies face is that if they prohibit or refuse to allow a development the agency response must be based on fact and able to be argued on that basis at VCAT or the Land and Environment Court or similar arena of competent jurisdiction.

The other side of that coin is that land management agencies at any level of government must be prudent and undertake fire prevention and fuel management tasks on their side of the fence. This has demonstrably not occurred in many instances allowing rapid and vigorous fire behaviour in semi urban or semi rural areas.

Coupled with rapid penetration of fire in to semi urban and urban areas via vegetated public and freehold is the ability of building design and the home garden to add to the carriage of fire in urban areas via poor choices in building design, materials used, proximity of flammable vegetation to the dwelling and use of organic mulches. We now have the tools to determine threat of wildfire in these areas, whether government has the will to anything to ameliorate threat is another matter.

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Burning regimes in National Parks, other protected areas and forests.

When I was a very young park ranger more than 20 years ago the burning practices were very much orientated toward fuel reduction roughly corresponding to a 7 – 10 year cycle based on work in South East Australia that indicated 90% + fuel accumulation potential at 10 years.

The fuel accumulation curve is generally accepted as being at a steady state equilibrium after 20 years for most vegetation types in South Eastern Australia. There was no thought given to plant and animal life cycles or the impact of repeated burning.

It is now known from the work of Tolhurst et al in the Wombat Forest and elsewhere that while there are impacts on fauna and modification of vegetation structure from repeated annual or biannual burning programs most species appear to be resilient enough to persist via one or more mechanisms with no apparent extinctions.

Continued suppression of wildfire and in the absence of fuel reduction burning and ecological prescription burning can have an opposite effect and result in local extinctions of flora and fauna. A case in point occurred at Cox Scrub Conservation Point 50 kilometers south of Adelaide where an entire bird species population was wiped out in a day

This is particularly the case in smaller island parks in a sea of agricultural land where lack of effective dispersal mechanisms can prevent natural recolonisation of plant and animals.

Similarly threatened species often naturally rare or restricted in range by habitat requirements prior to European settlement can suffer from major wildfire events – particularly as the array of predators is now larger and more numerous than before.

Biodiversity and Serial Disturbance Mechanisms

I do not believe that the role of fire and other mechanisms such as flood, earthquakes or logging for that matter is well understood or appreciated. The process of serial disturbance is gaining some credence though not all species requirements for disturbance are yet known.

What has been shown is that many plant species require periodic disturbance to remain in the landscape or there is a high risk that species will complete their life cycle and remain only as seed awaiting some form of disturbance.

In the absence of any form of disturbance the viability of the seed store will degrade over time ultimately ensuring the extinction of plant species and the animals that depend on the plants for habitat

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Fire Suppression Capability

I am concerned that 20 years on from Ash Wednesday there remains a plethora of cultures and legislation amongst government agencies charged with fire prevention and suppression. There is now doubt that training, equipment and communications systems are far better than was available in 1983 however the fact remains that the myriad cultures are affecting the fire prevention and suppression effort.

There also appears to be a persistent belief that 'it won't happen in my patch' when in fact it can and will happen. The other concern in this vein is that fire is a landscape issue and has no respect for lines drawn on maps. The combination of poor land use planning, and lack of resourcing for fire prevention works coupled a lack of political will has resulted in incidents as has been seen in the Canberra episode and the Dandenongs in 1996.

Incredibly enough there is also a failure to understand that risk of wildfire ignition, apart from lightning, is directly related to human activity with arson a major cause in so far as I can gather right around Australia. The statistical database supporting this assertion is suspect in itself and varies widely from agency to agency and from state to state.

From my own observation the existing data is not used to the fullest extent in planning fire prevention and in land use planning decisions. A notable exception that goes part way is the recent legislative and land use planning developments in NSW of recent times. The key here is that land use planning decisions and historical probability of fire should be a factor in placement of suppression capability in the landscape.

Suppression capability is also a function of human demographics in the landscape and it should be noted that in Victoria CFA volunteer numbers have fallen from about 120,000 in the early 1980's to about 68,000 currently. Of more concern are the rapidly rising age classes of the remaining volunteers particularly in some rural areas.

Over the next ten years many firefighters with high levels of experience, skill and knowledge will retire. To some extent there has been attempts to redress the aging process through the Project Fire Fighter program and through the recruitment of skilled people into the CFA in Victoria. The picture in South Australia and New South Wales is no so proactive.

The last point is that the increasing use of aircraft is creating a false sense of security amongst fire suppression agencies. The recent high country fires in NSW and Victoria should dispel this urban myth. At the time of the 85 lightning strikes that ultimately resulted in the very large high country fires of 2003 I made the prediction that the suppression agencies had 4 – 5 days to extinguish the fires.

As I recall 81 of the 85 fires were extinguished before smoke and convection systems severely curtailed the use of aircraft over the next 40 days of suppression operations resulting in a grinding arduous ground fire suppression campaign. The outcome is that while aircraft are a valuable tool aircraft cannot and should not be expected to perform miracles particularly in extreme FDI conditions.

Research Requirements – The Landscape Approach

The literature does not contain any body of research in Australia that looks at fire at the landscape scale. Some work has been undertaken in the boreal forests of North America but to my knowledge the divergent land management cultures of government and local government agencies in South East Australia has effectively prevented this approach.

At the time of writing reactions from agency personnel appears to be along the lines of 'we're ok Jack' meaning that our patch is good shape without looking at the wider landscape perspective. Certainly there is a range of local regional and agency based forums charged with fire prevention and suppression though I doubt that members of those forums are aware of or can have a significant impact on some of the issues raised in this submission.

I also fear that the research agenda under the CRC Bushfire Research Programs will achieve a great deal as from where I stand much of the research will be directed at issues that are to a greater or lesser extent the hobby horses of fire management agencies and the research institutions involved.

I would like to think otherwise but I remain to be convinced that Australians have not embraced fire management as an integral part of living with the Australian biota and that fire will remain as an issue as long as Australia continues to drift north into the drier latitudes and encounters the vagaries of climate change.

It is my view that losses of life and property are likely to increase particularly on the urban fringes of major towns and cities until sound land use planning decision are supported by verifiable research techniques that lead to a sound replicable body of data that effectively guides fire management and suppression and land use planning decisions.

Similar comments can be made in respect of the maintenance of biodiversity with many tertiary institutions remaining mired in the concepts of descriptive ecology rather than seeking to proceed to an understanding of functional ecology and understanding the role of fire as a serial disturbance mechanism vita for the maintenance of biodiversity in Australia.

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