14 November 2003

School of Resources, Environment
and Society
Australian National University
Canberra, ACT 0200

The Chairman
COAG National Bushfire Inquiry
Department of Prime Minister and Cabinet
3-5 National Circuit
BARTON ACT 2600

Dear Sir,

I attach a submission to the COAG National Bushfire Inquiry.

There may be particular difficulties in achieving effective fire management within the east coast forests. It is argued that the public good may be served by integrating the functions of the NSW National Parks and Wildlife Service and State Forests of NSW within a single forest management authority. This argument applies to both the conservation and fire management roles.

I believe the submission is consistent with the terms of reference of the Inquiry.

Yours sincerely,

Dr Ross Florence
Visiting Fellow

Submission to National Inquiry on Bushfire Management, Prevention and Mitigation

UPGRADING FIRE MANAGEMENT IN EAST COAST FORESTS: THE CASE FOR A SINGLE FOREST MANAGEMENT AUTHORITY

Dr Ross Florence, Visiting Fellow
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Recommendation

The COAG committee is urged to place before the appropriate governments (i) the potentially high cost of enhanced fire management within the subtropical east coast forests and (ii) the need to examine resource management models which might facilitate more effectivefire management at a socially acceptable cost. 7lrese should include the model projected here, that is, the integration of many conservation, wood production and fire management_functions within a single forest management authority.

Summary

The recent incidence of highly damaging forest fires demands a sharper focus on their severity, and ways limiting their impact. This Submission notes the great increase in fuel loads since European settlement, the `complete protection' philosophy of early forest services, and the subsequent introduction of fuel reduction (prescribed) burning as a primary protection methodology. Prescribed burning has been more consistently applied, and more successful, in states with a Mediterranean-type climate (notably Western Australia and Victoria), than within the subtropical east coast forests.

The Submission suggests a number of impediments to more extensive prescribed burning in east coast forests. However, even if some of these were removed (e.g. a larger workforce), it may still be difficult to implement an adequate prescribed burning program. Thus it is essential to upgrade the physical fire protection infrastructure, including enhanced firebreak, road and fire trail networks.

The Submission argues that the public good will be served by integrating conservation, wood production and fire management functions within a single forest management authority. Within NSW, State Forests and the National Parks and Wildlife Service have broadly overlapping responsibilities. For example, State Forests contributes to national conservation targets through designation of protected and special forest management zones, and must conform with agreed standards of ecologically sustainable management

Quite apart from the contribution that wood production can make to regional and state economies, it can, in an integrated system, help meet the potentially high cost of effective fire management through the total forest estate. Moreover, the more profitable plantation

sector (itself established in part through native forest royalties) should be part of the financing equation.

The condition of the forests at European settlement

When Europeans arrived in Australia the eucalypt forests had, by many accounts, a `woodland structure', that is, large-boled, wide-crowned, widely-spaced trees over an open and largely grassy forest floor'. While this condition is often attributed to lightning fires and Aboriginal burning, it may also be related, in a more fundamental way, to the biological attributes of the eucalypt forests and natural processes within them [1].

As part of their evolutionary adaptation to low-nutrient soils, eucalypts takes up nutrients when available in the soil (e.g. after a fire) and conserve them efficiently within the crown and sapwood. Consequently, material falling as litter has a low nutrient content and this, in turn, adversely affects the soil microflora and nutrient cycling processes. Under these conditions the shrubby understorey - which may have developed at a regeneration phase or following a later fire - will decline, a process accelerated by the eucalypt's capacity to compete strongly for water in limited supply. Thus fuel loads derived from an understorey may have been relatively low in the pre-settlement forest .

There is another reason for low fuel loads in the pre-settlement forest. The amount of litter on the floor of a largely undisturbed old-growth forest will be appreciably less than that at earlier growth stages. As regrowth develops through the pole stage, the litter biomass builds up rapidly to a point of peak fuel energy storage - as early as 35 years in stands of fast-growing species. Beyond this point, the litter biomass declines as the rates of crown expansion and litterfall decline, as the shrubby understorey breaks up, and as the accumulated litter is incorporated into the soil organic matter.

It may be these natural successional process - as much as pre-settlement fire - which limited the build up of forest floor fuels, and hence the frequency of more intense fires.

The forest condition following European settlement

The forest condition has changed radically since European settlement. Few eucalypt forests (including unlogged forest) can be said to be in a natural condition - where `natural' refers to the forest condition at settlement. Settlement can be characterised by a long era of uncontrolled wildfires. Fires were lit regularly to protect cleared land, to enhance access, and to provide relief grazing in dry periods. Sometimes these fires became major conflagrations and did considerable damage"to the forests. Under these

1 Quoted froom D.Ryan (1993/94) The original forest. *Australian Forest Grower* (Special wildfire section), Summer 1993-94,16.

2 Florence, Ross (1994) The ecological basis of forest fire management in NSW. In *The Burning Continent*, pp 15-34. Institute of Public Affairs, Current Issues, September 1994.

conditions, old-growth ecosystems were `destabilised', that is, the mature and overmature trees of the forest could no longer exert strong control on ecosystem processes.

Thus few forests now have the distinctive woodland structure. There may be greater structural and floristic diversity incorporating, for example, a generally incomplete and irregular upper canopy, weakened and often deeply fire-scarred old-growth trees, patches of regrowth trees in different development stages, a persistent shrubby understorey, and a considerable accumulation of diverse litter materials. Moreover, there has been, in many of the subtropical forests, a progressive upslope extension of a wet sclerophyll (rainforest element) understorey. During lengthy dry periods this becomes part of the fuel load.

These impacts on the forest condition may be greater where part of the growing stock has been harvested, and particularly where inadequate regrowth has developed.

The complete protection philosophy of the early forest services

Modern forest services were formed in the early 1900s. One of their primary functions was to limit the destructive impact of recurrent wildfires. The forest services adopted a policy of complete protection. Fire-break systems were constructed around and within the more accessible forests, surveillance towers were built, fire attack standards developed, and the often substantial workforce of those days was trained in fire fighting practice. Despite scepticism that recurrent wildfires could ever be properly contained, there was some measure of success in reducing the frequency of wildfires.

However, the complete protection philosophy may, in the event, have been counterproductive. Where fires did start and were not immediately controlled, the greater structural complexity and increasing fuel loads generated fires of great severity.

Prescribed (controlled) burning

Prescribed burning was a logical response to the wildfire problem, that is, burning to reduce fuel loads under relatively mild weather conditions. The practice has been used in all states, though most extensively and consistently in those with a Mediterranean-type climate (notably, Western Australia[3] and Victoria[4]).

A major thrust in Western Australia followed the 1960/61 fire season when a Royal Commission recommended that every endeavour be made to improve and extend the practice of control burning. Subsequently, the south-west forests became the focus for development of sophisticated prescribed burning guides, and for wildfire research. The recent publication *Fire in ecosystems of south-west Western Australia: impacts and management*[3] recognises that regulated burning will play an important role in conserving the rich biodiversity of the region. This will require an appreciation of the way individual

[3] I. Abbott and N.Burrows (eds) 2003 *Fire in ecosystems of south-west Western Australia: impacts and management.* Backhuys Publishers, Leiden, The Netherlands

[4] K.G. Tolhurst and N.P. Cheney (eds). 2000 *Synopsis of the knowledge used in prescribed burning in Victoria.* Department of Resources and Environment, Victoria.

species and communities respond to fire, and the design of a diverse array of burning regimes to accommodate them.

The position of prescribed burning is different within the east coast forests, and particularly within the subtropics (effectively, north of Sydney)* Here the use by State Forests of both post-harvest slash reduction burning and prescribed burning has declined appreciably in recent time. For example, while the Mid North Coast region has a general policy of burning about 2% of the forest area per year, this is now rarely achieved. During 1997 to 2000 there was no prescribed burning within this region - except to protect high value assets.

There are probably many factors contributing to a reduction in prescribed burning activity. While it is difficult to nominate the more critical of these, the following will have played some role:

- great diversity within the forest vegetation
- complex topography within the mountain and escarpment forests
- the variable climate within the subtropics
- reduced funding over time and reductions in the labour force
- difficulties in achieving effective mild to moderate burns where there is an increasing wet sclerophyll understorey
- the increasingly complex urban-rural interface along the east coast and social concerns about smoke pollution; and
- opposition to burning on conservation grounds

Alternative fire protection strategies

These impediments to wider prescribed burning suggest that, even if it were possible to resolve some of them (e.g., through increased funding and a larger workforce), it may still be difficult to implement a comprehensive prescribed burning program. Inevitably, the variable climate of the east coast, difficult terrain, an increasingly mesophytic understorey, and the complex rural-urban interface will limit the scale and effectiveness of such a program.

It follows that while every effort should be made to expand the prescribed burning program, greater consideration must be given alternative fire protection strategies. More effective fire management will depend on an upgraded fire protection infrastructure, and a greater aerial suppression capability. The fire protection infrastructure will include measures to enhance early detection, strategically located and well-maintained fire breaks, adequate road and fire-trail networks to facilitate rapid containment of fires, field depots maintained as a base for fire-fighting operations, and so on.

If we accept the need for an enhanced fire protection capacity in this way, there are now two questions to address:

5 Florence, Ross *(2001) Review of Forest Management Practice in New South Wales, 1945 to 2000.*. Consultant Report to CSIRO Division of Forestry and the Australian Greenhouse Office.

would a single management agency, with responsibility for all public forest, more efficiently protect the forest estate than two often competing agencies (State Forests and National Parks) with different objectives and management cultures; and;

(ii) to what extent can wood production within the state's forests (including both native and plantation forests) contribute financially to fire protection and other management operations within the total forest estate.

Managing conservation forest

From the 1950s, the policy of all governments in NSW was directed to maintaining domestic wood supply from the native forests while building up rapidly a more productive plantation softwood resource. This involved harvesting all commercial product from the old-growth mountain and escarpment forests, and selectively logging the coastal region forests - but restricting expenditure on essential regeneration and other silvicultural treatments. While clearly an effective wood supply strategy, the seeds of environmental conflict were sown in this way.

Opposition to these policies and practices developed over several decades, culminating in the Regional Forest Agreement (RFA) of 1998, and the allocation of large areas of State Forest to National Park. Moreover, there has been continuing environmental pressure to withdraw logging from native forests altogether. This is perhaps an understandable response by those who look only at the relatively seamless transition from a hardwood to a softwood dominant forest economy, and believe all wood demand can now be met from plantation forests.

However, we might question whether, during the RFA process, there was sufficient focus on the difficulties governments would face in managing and financing the conservation estate it was creating. A series of drought years has amply demonstrated that society can't simply lock up the forests and throw away the key!

The noted U.S. environmentalist, Jerry Franklin, believes that dividing the world's forests into fibre farms (plantations) and native forests (largely `preserved' from active management) is a potentially dangerous solution to environmental conflict[6]. He recognises that society will need to be continuously engaged in active management of all native forests, even if no longer used as a source of wood products. This will involve, among other things, management of fire regimes, responding to consequences of climatic change, protection against exotic organisms, maintaining biodiversity within fragmented landscapes, and re§toring and maintaining damaged ecosystems.

[6] **Chapter in D.Lindenmayer and J. Franklin (eds) 2003** *Towards Forest Sustainability*. *CSIRO* **Publishing Melbourne**

This applies in full measure to Australia's east coast forests - to which we can add the need to address the worrying incidence of chronic stand decline within forests under all land tenures.

Clearly society faces a great cost in properly managing its forest resource - whatever the tenure. It is necessary to address how this might be most efficiently and effectively done.

The case for a single forest management agency

How should society respond to recurrent and damaging fire? Because of the ever-increasing demands on the public purse, it is essential to examine all possible ways of facilitating and financing higher standards of fire management. This is particularly pertinent where we accept the potentially high infrastructure costs within the east coast forests. Against this background, governments might review their stewardship of the public forests, and particularly the present model of allocating public forest management to separate agencies - despite their having overlapping conservation, fire management and other responsibilities.

Governments might start by questioning whether the `black and white' notion of the `state forest versus the national park' is (or should be) an outmoded concept. Circumstances have changed. In NSW, State Forests has a significant conservation as well as a wood production mandate. It is accepted nationally that conservation targets will be met through a combination of national parks, protected zones within State forests, and forests harvested by special prescription.

Moreover, State Forests is required by government to maintain or increase the full suite of forest values within the wood production forest, to conserve biological diversity, to maintain the productive capacity, sustainability, health and vitality of forest ecosystems, and to protect soils and water. This is currently achieved through active cooperation between State Forests, the National Parks and Wildlife Service and the Environment Protection Authority; and in Queensland, National Parks already has responsibility for all native forests pending future withdrawal of wood production from them.

It is argued that under these circumstances, the public good will be better served by regarding the public forest as a single entity - with a `management continuum' from complete protection at one end of the spectrum, to priority wood production at the other (as illustrated in the following section). There could still be national park and wood production Divisions, but an overarching forest management authority would coordinate many of their common functions, including fire management, biodiversity conservation, and soil and water protection.

The public good would most certainly be served through a more integrated approach to fire management. Wood production and conservation forest can occur in a mosaic pattern. throughout the landscape. It makes a lot of sense to develop state and regional fire management strategies (prescribed burning patterns and fire protection infrastructure) within the one planning and operational framework.

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This model of resource management might require some (though limited) re-shaping of present land use patterns. Wood production might be allocated to forest which is particularly amenable to silvicultural and other management practices (whether currently in state forest or conservation reserves), to forest in need of restoration, and to forest so located as to facilitate extension of active management (firebreaks, roads and fire trails) to adjacent or nearby conservation reserves. Given the amount of resource information accumulated during the RFA process, it should be possible to do this without compromising essential conservation objectives.

Governments must also address the cost of fire protection within the integrated authority. It is a basic premise of this Submission that, quite apart from the contribution it makes to regional and state economies, wood production can facilitate fire and other management programs in a coordinated way through the total forest estate. This is not to imply that log sale revenues can necessarily support a range of operations beyond the wood production forest. Rather, extended prescribed burning programs, and an upgraded fire management infrastructure, will be more effectively and efficiently developed within the one planning and operational framework.

Wood production can make a greater financial contribution to fire. management where the softwood plantation sector is part of the financial equation. Plantations were funded in part (in most states) through monies derived from native forest logging. While many foresters were concerned at the environmental impacts of harvesting during the high wood demand era, they believed there would be ample opportunity to upgrade forest management (including restoring the productivity and ecological condition of the forest) as the plantation program entered its mature phase and generated positive financial flows. However, disappointingly, this has not happened.

It may be time to restore the financial integrity of the total forest system.

The management continuum concept under a single authority

It is envisaged that under a single forest authority, a single planning process would determine the most effective fire protection infrastructure, and recognise a pattern of management zones, each with specific conservation/production priorities, management practices, prescribed burning programs, and so on. The zones would include:

1. protected forest with conservation of biodiversity as the primary function (incorporating the national park estate).

2. areas of forest with a primary conservation role - but with some wood harvest to access particularly high value products and/or facilitate the provision of roads and trails for fire protection purposes within conservation forest.

3. smaller scale conservation areas located within areas of production forest and designed to conserve particular biotypes or other significant features.

4. forest where harvesting is permitted, but under special prescriptions designed to conserve some special feature or endangered animal (e.g. the koala).

5. forest with wood production and biodiversity conservation as co-equal objectives - perhaps forming the bulk of the wood production forest.

6. natural uneven-aged forest with a wood production priority.

7. plantations or areas of even-aged monoculture within native forest and where priority is accorded wood production.

8. large scale plantation forests (including the softwood forests) established by clearing State forest or through land purchase by the state.

Within the wood production zones management practice will differ appreciably from that of the past. Harvesting will no longer be influenced by strong wood supply pressures and can focus largely on value-added domestic and export markets. Silvicultural practice can be conservative and ecologically sustainable, specifically designed to maintain natural species patterns, structural diversity, wildlife habitat, and well-stocked, healthy and dynamic stands.

A COAG Committee recommendation

To be realistic, it is appreciated that the COAG Committee is unlikely to submit a recommendation to governments directly advocating the integration of conservation and wood production functions within the one authority. However, the Committee is urged to place before governments the underlying principle, that is, that society should examine a number of resource management models (including that projected here) which can facilitate more effective fire protection in the most cost-effective way - and without compromising conservation objectives.