

Council of Australian Governments

Inquiry into bushfire mitigation and management in Australia

**A submission by the
Institute of Foresters of Australia (IFA)**

5 December 2003

Contents

Executive Summary	3
1. Introduction	5
1.1 This submission	5
1.2 The Institute of Foresters of Australia	5
1.3 The IFA and fire	5
1.4 Our concerns about the state of bushfire management in Australia	6
1.5 The IFA welcomes this Inquiry	7
2. Issues addressed in this inquiry and the IFA submission	7
3. Background: a brief review of the bushfire situation in Australia	7
3.1 Australia is naturally bushfire prone.....	7
3.2 The consequences of European settlement	8
3.3 Dealing with bushfires.....	8
3.4 Fire and the community	9
3.5 The bushfire cycle.....	10
3.6 Social pressures at the urban fringe	10
3.7 Looking ahead if nothing is done	11
3.8 Best practice	11
4. Review and recommendations	12
4.1 Policy and best practice	12
4.2 Bushfire risk factors and risk management.....	13
4.3 Alternative bushfire mitigation and prevention approaches	18
4.4 The appropriate direction of research into bushfire mitigation and management;	19
4.5 Planning and building codes with respect to protecting life and property from bushfires.	20
4.6 Bushfire mitigation and response arrangements and costs	20
4.7 Fire management resources	21
4.8 Liability and insurance	23
5. Conclusions	24
Appendices: IFA Fire Policies	25
1. Managing Fire – the policy of the Institute of Foresters of Australia	25
2: The role of fire in Australian forests – the policy of the Institute of Foresters of Australia	27

Executive Summary

The Institute of Foresters of Australia (IFA) is the organisation representing professional forest managers and forest scientists in Australia. Bushfires are a day-to-day preoccupation of many of our members, either through our work as forest, plantation and park managers, or because we are involved in research, teaching, industry or administration of forest management organisations and have personal responsibility for bushfire mitigation and suppression. We are an independent Australian-wide organisation with significant professional and practical expertise and have developed our own comprehensive policies on fire management and the role of fire in Australian forests.

We welcome this Inquiry. We regard the bushfire situation in Australia as deeply unsatisfactory and likely to further deteriorate if responsible action is not taken. This is demonstrated by the damage, devastation and cost of fires during recent fire seasons across Australia, and the fact that policy and practice by State governments and some agencies responsible for land management is failing to reverse negative trends.

The Institute of Foresters especially welcomes an inquiry by COAG. This is because we advocate a national approach to bushfire prevention and fire management, and such an approach will require a high level of coordination and cooperation between various jurisdictions and agencies. This approach should be directed at minimising the cost of bushfires in terms of human life and valuable assets (including environmental assets), must be based on science and fact rather than ideology, and should allow for cooperation and coordination across states and tenures. In our view a primary objective should be to place responsibility for bushfire management in the hands of land managers, not emergency services. A critical ingredient which is lacking is political leadership.

Institute members have observed major changes in forest landuse across Australia in recent years, principally the transfer of State forest to National park. This has been accompanied by significant changes to fire management policies in some areas, for example (1) a re-ordering of fire management priorities from life and property to the environment and (2) the declaration of “wilderness” areas where policy can lead to reduction in access for firefighting, fuel accumulation and allowing lightning fires to burn. This has also occurred at a time when State agencies in general have reduced staff, fewer funds, and greater pressure to focus on core internal values, rather than exercising their Duty of Care to neighbours and the wider community.

The IFA is also concerned about the focus on the development of building codes for homes in fire prone areas rather than on the key issue of providing adequate separation between the homes and bushland and the maintenance of gardens and surrounds in a condition of low flammability. Properly prepared homeowners can do much to reduce bushfire damage and should be given the right, by legislation, to protect their own property in the event of fire.

The submission reviews the background to the bushfire situation in Australia, identifies the key issues and makes a series of specific recommendations relating to each.

Finally we make four overarching recommendations. These are that the Council of Australian Governments:

1. Develops a National Bushfire Policy, based on science and experience, which crosses land tenure, administrative jurisdictions, transcends ideology and is implemented Australia-wide.
2. Seeks to bring about true accountability at Ministerial level (State and Federal) for bushfire outcomes. This should be accompanied by the development and adoption in each State and Territory of a Best Practice bushfire system, incorporating clearly stated objectives, targets and performance standards, fire management plans, fire research programs, and arrangements for independent audit and public reporting on bushfire mitigation and management outcomes. The aim should be for the Commonwealth to fund the development and implementation of Best Practice bushfire management systems, rather than coming in after the event to fund firefighting and disaster relief.

3. Makes a firm commitment to the need to reduce forest fuel levels by prescribed burning wherever it is feasible, and under the direction of skilled professionals. The aim would be to provide firefighters with a chance of controlling intense fires, as part of the holistic system of fire management which incorporates preparedness, prevention, rapid detection and efficient suppression.
4. Develops and promotes the implementation of programs aimed at achieving a well-educated public, a community which understands bushfire risks to the extent that it is prepared to take, and to support effective fire prevention action at both the landscape and the householder levels.

The Submission is accompanied by copies of the IFA's draft national policies on bushfire management and the role of fire in Australian forest ecosystems.

(IFA contact is J. Adrian O'Loughlin, Executive Director, Institute of Foresters of Australia

Ph: 02 – 6281 3992 Email: ifa@forestry.org.au Postal: PO Box 7002 Yarralumla ACT 2600)

1. Introduction

1.1 This submission

This submission is presented to the panel appointed by COAG to inquire into bushfire mitigation and management, arising out of the recent bushfire disasters in Australia. It is prepared by the Institute of Foresters of Australia. It comprises an overview of the bushfire situation from the perspective of professional forest managers and forest scientists, makes specific recommendations relating to the most important issues identified by Australian foresters, and sets out four over-riding recommendations for action by COAG.

This written submission can be supported by verbal presentation. The Institute would appreciate an opportunity to speak to the committee, and respond to questions from it.

The IFA is aware that bushfires occur across the length and breadth of Australia, and that some of the largest and most frequent fires occur in coastal heath and the rangelands of the interior of the continent, which together cover the bulk of the country. This submission does not focus on these areas or these fires. We have concentrated on the mainly forested and higher rainfall areas, where the bulk of the Australian public live. It is in this area that bushfires are the major threat to human and environmental values.

1.2 The Institute of Foresters of Australia

The Institute of Foresters of Australia (IFA) is the organisation representing Australian professional foresters. The organisation was formed in 1930, has active branches in all Australian States and the ACT, and is governed by an elected Board. A requirement of membership is that members have University level qualifications in forestry or a closely related scientific discipline, or extensive relevant practical experience in forest management or forest science.

The IFA is an advocate for better forest management in Australia, for high professional standards in forest and woodland management and for the active management of our forests for all values.

Current membership is approximately 1200. Members are employed throughout Australia, and overseas, and in a variety of occupations, including native forest, plantation and national park management, research, bushfire management, land care, education, public service administration, private forestry and industry. The age and experience profile of our members ranges from new graduates to retired men and women with over 50 years of experience in forestry, park and land management in Australia.

1.3 The IFA and fire

The Institute of Foresters is the only organisation in Australia which has developed comprehensive national policies on bushfire management and the role of fire in Australian forests and woodlands.

We have had a bushfire management policy for over 25 years. This is currently being reissued as two separate policies, one dealing with fire management and other with the ecological role of fire in Australian forests and woodlands. The restructured policies are still in draft form, but close to finality and are a sound representation of our thinking on, and approach to, these issues. They are printed in full in Appendices 1 and 2 of this submission, and underpin this submission to the Inquiry.

Our concern for these issues stems from a number of factors:

1. Since the early years of the last century, and until recently, bushfire management in Australian forests and woodlands was predominantly the responsibility of forestry agencies staffed by professional foresters. Many IFA members have spent almost their entire careers as practical forest, park and plantation managers, where bushfire prevention, firefighting and fire-related research and development are a day-to-day preoccupation. We know the business, from the sharp end.
2. Professional foresters pioneered and became leaders in nearly every aspect of bushfire research in Australia since this work began. This includes research into fire behaviour, fire prevention, prescribed burning, fire suppression, bushfire safety and health, fire training, fire ecology and fire weather forecasting.
3. Australian foresters remember the lessons of history of bushfire disasters in this country, – the Black Friday and Ash Wednesday fires in Victoria and South Australia, the Dwellingup and Karridale Fires in Western Australia, and the Hobart and Sydney fires - and took part in fighting

them, in subsequent inquiries and royal commissions, and in the application of fire management systems designed to minimise the risk of their re-occurrence.

4. IFA members have received university-level training in the science underlying bushfire behaviour, fire suppression and prevention, as well as in fire ecology, and land use planning which incorporates fire management and many have practical experience with prescribed burning, regeneration burning and firefighting;
5. We have a deep concern for Australia's forests and for the values within them that are threatened by high intensity bushfires. Many of our members live within these same rural communities. We wish to see land management practices which protect life and property from the ravages of wildfire, and which minimise attendant human tragedies and environmental damage. We believe that there are no significant forest or community values which benefit from the impact of uncontrolled high intensity bushfires.

1.4 Our concerns about the state of bushfire management in Australia

The IFA is deeply concerned at the directions in which bushfire management in Australian public native forests has moved in recent years. We are appalled at the level of damage to ecosystems, water catchments, rural assets, homes and life that occurred Australia-wide during the 2002/3 summer and at the unprecedented size and destructiveness of these fires. We believe this to be a clear indicator that not only has Australia not moved forward (in terms of bushfire management) since the disastrous fires of the last century, but there is a risk that we are going backwards.

There are several critical factors.

Firstly we see a lack of firm political leadership, absence of coordination and accountability at Ministerial and agency level, and a lack of commitment to effective bushfire management within some land management agencies. This situation fails to build on the excellent relationships existing within bodies such as the Australasian Fire Authority Council (AFAC) and the Forest Fire Management Group convened by the Forestry and Forest Products Committee. In these forums bushfire specialists are able to come together and work cooperatively and amicably.

Secondly, we see the community divided over fire management and the divide (especially between urban and rural communities) deepening. Familiar position-taking is occurring. On one side of the divide are politically-influential environmentalists and academics, supported by inner-city residents not threatened by bushfires, and not responsible for either bushfire management or bushfire outcomes. These people tend to advocate a hands-off approach to land management, where "natural" events like bushfires are allowed to run free, and to oppose bushfire mitigation practices such as fuel reduction burning. On the other side are rural people, fire fighters, foresters, farmers and land managers who are responsible for protecting the values threatened by bushfires, who are legally accountable for bushfire outcomes and who are personally threatened by fire events. These people tend to advocate an interventionist approach, where bushfire mitigation work is undertaken to minimise risks before fires start, as well as having in place a well-equipped rapid-response fire fighting force.

This divide is becoming institutionalised, and reflected in policy positions adopted by different agencies and political organisations. To add to the problem, responsibility for fire management is increasingly being taken out of the hands of land managers (who are trained to minimise threats and hazards) and placed in the hands of emergency services (where the emphasis is more often on response to a disaster after it occurs).

In the long run, placing the emphasis of fire management on suppression rather than mitigation and prevention will ensure that wildfire disasters will continue to occur. This is because on the bad day, with multiple simultaneous fires and heavy fuels, no firefighting force on earth will succeed...

The nature and elements of a "Best Practice" bushfire management system are well known, but nowhere are they applied in Australia. In its place there is a mishmash of legislation and policy, a splintering of resources, lack of accountability, and a growing tendency to focus on suppression rather than prevention and mitigation. This amateurish approach to risk management means that disasters come in an inevitable and predictable cycle.

Finally we do not see a system in Australia in which good fire management is financially rewarded. The reverse applies. Failed management at the State level, as demonstrated by the occurrence of "killer"

bushfires, is rewarded when governments fund emergency firefighting and post-fire disaster relief and rehabilitation.

1.5 The IFA welcomes this Inquiry

The IFA welcomes this Inquiry by COAG. We see it as an opportunity to put our concerns and make recommendations for improved bushfire management to responsible people who have the wider interests of the Australian people and landscape at heart. COAG is a particularly useful forum since it brings together the two main levels of government in Australia: (1) the Commonwealth, which has national interests at heart, and (2) State and Territory level where responsibility for land management resides. The Institute is especially concerned about the bushfire management at State and Territory level; here policy making is often influenced by urban and parochial political imperatives rather than by responsible land management objectives. In this situation the influence of COAG is critical, as it brings together policy makers at both levels.

2. Issues addressed in this inquiry and the IFA submission

The objective of the COAG inquiry into bushfire mitigation and management in Australia is to review and report upon the current state of bushfire management in Australia, including:

- risk factors contributing to bushfires, including deliberate fire lighting;
- bushfire mitigation strategies in national parks, state forests, other Crown land, other open space areas adjacent to urban development and private property;
- the impacts of bushfires on the environment, human life, property and the economy;
- the impacts of fire mitigation strategies, such as hazard reduction, on the environment, human life, property and the economy;
- the adequacy of infrastructure and human resources for fire mitigation purposes; and,
- the use of existing fire fighting resources, including an examination of the efficiency of resource use and co-operation between agencies and between jurisdictions; and
- the identification of best practice national measures, cooperation and standards that can be undertaken by all levels of government, industry and the community, and the economic, social and environmental costs and benefits of such measures.

In this submission, the IFA will comment on each of these issues and make specific recommendations. In addition we review the overall situation relating to bushfire mitigation and management in WA and propose a series of overarching recommendations for consideration by COAG.

3. Background: a brief review of the bushfire situation in Australia

3.1 Australia is naturally bushfire prone

Most of Australia is naturally bushfire prone. The continent experiences a “fire season” every year associated with the annual dry season (summer in the south, winter and spring in the north). The severity of the fire season varies from one year to the next. It is largely dependent on the extent of the rainfall deficit during the dry season. About every 10 years the drought is so severe that normally moist vegetation dries out, accumulated fuel becomes flammable, natural barriers to fire such as swamps and rivers dry up and disappear, and the overstorey vegetation is stressed to a degree that it sheds its foliage and adds significantly to the fuel loads on the forest floor. Even rainforest can dry to a degree that there is sufficient dry fuel to carry a high intensity fire during the severe droughts that occur periodically (and inevitably) in Australia.

Once the vegetation is predisposed by drought and is flammable, all that is needed to create a conflagration is a period of extreme weather with high temperature, strong dry wind and an ignition source.

Ignition sources cannot be eliminated. Despite the best intentions and efforts of fire prevention policies and personnel, ignition and bushfires occur. Dry lightning storms occur extensively in some seasons, accidents happen, and unfortunately there will always be deliberate malicious ignition by arsonists.

Apart from a small number of plant species with high salt content or little volatile oil in their leaves, most of the natural vegetation of Australia, and most of the non-indigenous vegetation introduced by farmers and plantation-growers, is highly flammable.

Thus, bushfires are an inevitable part of the Australian environment. Fires of low and moderate intensity occur every year, and serious high-intensity bushfires occur every few years, and have done so throughout our recorded history.

High intensity fires are a consequence of one or two factors, or both operating together: (1) predisposing drought and hot dry weather; and (2) heavy fuels. The decision to deliberately exclude fire from naturally fire-prone ecosystems (which leads to heavy fuels) represents one extreme of the possible range of fire regimes, and in practical terms this inevitably translates to a regime of periodic large-scale, high intensity fires. These can burn right across the landscape and tend to result in homogenous stands of largely even-aged vegetation. It is these fires that most often cause loss of life and extensive damage to private property and community assets.

3.2 The consequences of European settlement

Aborigines lived in harmony with the bushfire-proneness of Australia for perhaps more than sixty thousand years. Although denied by some academics and environmentalists, it is nevertheless clear that in pre-European times, fire was extensive and frequent. This is supported by ethno historical research, the records of early explorers and settlers and the reconstruction of the fire record from grass trees. Aboriginal people had little capacity for suppression of any but the mildest of fires and surely would have understood the potential for conflagration fires to burn thousands of hectares where fuels were heavy and continuous. The inevitable consequence to the Aboriginal people of very large intense bushfires was immediate loss of food supplies.

The Institute of Foresters has reviewed the evidence on Aboriginal burning. We are satisfied that all the evidence points to the fact that they carried out frequent, regular and wide scale burning throughout the year to create a mosaic of burnt and unburned patches that limited the extent and intensity of fire spread under severe weather conditions.

Even if regular, deliberate burning by Aboriginal people is denied, a simple understanding of weather patterns, fire dynamics, natural fuel accumulation rates and the occurrence of lightning indicates that fires must have occurred, and been common and widespread. Bushfires burning in summer in southern Australia are very hard to extinguish and “make safe” (to use the fire-fighter’s term); there are many accounts from as recently as the 1950s of bushfires burning for months through the dry season, occasionally dying down and then flaring up and making a long run, irrespective of cool night-time conditions or occasional showers.

Thus the most likely pre-European situation was one in which a pattern of naturally occurring fires started by lightning would have been overlain by deliberate burning by Aboriginal people. This situation would have applied for many thousands of years, and the flora and fauna which Europeans “discovered” in the 18th and 19th centuries would have been long adapted to it, indeed in harmony with it.

However, European settlement (particularly agricultural expansion after about 1880) resulted in the insertion of fire-vulnerable communities and assets into this fire-prone environment. At the same time, Aboriginal people declined in numbers and were stopped from practicing their traditional burning practices. Fuels began to accumulate, relieved only by occasional wildfire. For the first time, fire became a threat and bushfire damage a problem for Australian society. Europeans failed to appreciate or even acknowledge Aboriginal fire management, and developed the widely held view that all fires are “bad”.

Even today after more than 200 years of settlement, most Australians do not understand the relationship between fire and natural ecosystems, and do not appreciate that fire is a natural part of the Australian environment. Nor do they understand that bushfires can vary in intensity from a mild, trickling fire with flames less than a metre in height, to a raging inferno with flames over 100 metres in height. A large sector of the Australian community still believe that all fires cause permanent damage to “the environment”, and this view influences land management practices across the country.

3.3 Dealing with bushfires

Dealing with the bushfire problem boils down to a simple equation. On the one hand it is necessary to minimise the risks of fires starting and of causing damage to valued assets; on the other you must have a capability to suppress fires before threatened assets are burnt. This equation has been well understood by

practical land managers and fire scientists for generations. Effective bushfire management systems for forests and woodlands minimising the risks to all values have been designed, and in some cases implemented successfully.

Implementation, however, is not simple, and there is no general agreement on the approach to be taken. Bushfire management is complex and frustrating, and little real progress ever seems to be made, or is made and rapidly counteracted by some other development or policy decision. Some of the key problems faced by modern bushfire managers are:

1. Bushfire disasters do not occur every year. There is often a run of mild fire seasons, where fire intensities are low, fires are readily contained and little damage is done. The community becomes lulled into a sense of security. Funds for bushfire prevention and preparedness are channelled elsewhere. Foresters with long experience of bushfire seasons have an old saying: “10% of the fires cause 90% of the damage” – it is the irregularly occurring bad fire season for which the community must be prepared, not just the more frequent mild season.
2. In the Australian bushland, especially eucalypt forests, ground fuels do not quickly rot away into humus as they do in the cool temperate coniferous and deciduous hardwood forests of Europe. Instead, the forest floor litter of dry leaves, twigs and branches, and the thick fibrous tree bark accumulates year after year until a “steady state” is reached with massive quantities of fire fuel available for burning. Dry eucalypt forest, for example, accumulates flammable fuels at a rate of over two tonnes on each hectare every year and will continue to do so for decades. Bushfires burning in heavy fuel are difficult to control under moderate fire weather but under severe weather conditions which overlay a prolonged drought, a “firestorm” can develop that no firefighting force on earth has the power to control.
3. On bad days, bushfires always come in numbers. One fire leads to another as burning embers are carried aloft on high winds; lightning storms can generate dozens of strikes one after the other over a very wide area; and sorriest of all, whenever there are bushfires around, the criminal work of arsonists is activated. When fires come in numbers under severe weather conditions, even the biggest and best fire suppression force is quickly overwhelmed. This is probably the most important reason why fuel reduction must be undertaken beforehand – having a reduced quantity of fuel in the forest is the only factor which will assist when multiple fires occur simultaneously on a bad day.
4. A final and critical factor which has emerged in recent years, is the designation of so-called “wilderness zones” in the Australian bush by our State governments where access for firefighters is reduced. In these areas, especially in the absence of fuel management, large bushfires are virtually inevitable. Furthermore, once the fire is large it is also inevitable that it will burn out of the wilderness zone under extreme weather and will threaten life and damage property.

Western Australia provides a unique opportunity to review alternative methods of dealing with forest fires. Two quite different systems were implemented and subjected to field testing over many decades. The first (approximately 1920-1960) was based on the philosophy of rapid detection, good access and effective suppression by well-trained crews of firefighters. This was a replica of the system developed at about the same time in the USA by the US Forest Service. The second (from about 1961 to late 1990s) added to the first approach a systematic program of prescribed burning to reduce forest fuels. The outcome of the first system was a series of uncontrollable and disastrous bushfires in the 1950s and early 1960s. The outcome of the second was nearly 40 years free from damaging bushfires. Regrettably the second approach has been allowed to decline in recent years (i.e., the level of fuel reduction burning in forests has dropped dramatically), and the unsurprising result has been the first large high intensity forest fire in WA for nearly 4 decades.

3.4 Fire and the community

The IFA believes that bushfire issues are not well understood by the Australian community. On the contrary, knowledge of basic fire history and fire science is denied by many people, even some who hold responsible positions in land management agencies and academia.

In our view, this denial or misunderstanding is detrimental to an effective bushfire management system being implemented in rural and semi-urban Australia. Indeed, the events of 2002/3 highlight the fact that when it comes to bushfire management, Australia has not advanced significantly from where it was on Black Friday in 1939. We note:

1. Although the lessons of the past are well known, they can be forgotten or denied;
2. Although we have invested millions of dollars in bushfire research, its messages are often conveniently ignored or supplanted by ideology;
3. Although every Australian is faced with an increased burden of insurance, we continue to fail to undertake the most basic “preventative medicine”;
4. While fresh water and soil are our most critical natural resources, both are threatened by high intensity bushfires; and
5. Although a basic aspect of Australian culture is to look after your mates and try to be a good neighbour, some government agencies are being forced to move away from their duty of care responsibilities to the community.

3.5 The bushfire cycle

Australian foresters recognise an oft-repeated cycle in bushfire management. First comes the disaster – lives are lost, towns, houses and farms burn, forests are blackened, water catchments are devastated. This leads to a flurry of inquiries, commissions, political angst, and to Coronial Courts and litigation. All of this energises the agencies who work harder at bushfire research, and the design and implementation of an effective bushfire management system. Priorities are reorganised and funds made available for staff, equipment, roads and fuel-reduction burning. Legislation is modernised and strictly enforced. The success of this effort is striking: major fires do not occur. However, success in bushfire management is self-defeating, because it leads in turn to community apathy, political complacency, agency overconfidence, foolish planning decisions, budget reductions and a softer approach to law enforcement. In these conditions, environmental pressure groups flourish, and are able to successfully promote impractical and dangerous alternative fire management arrangements. Prevention and community education programs are reduced, fire-fighter numbers are allowed to decline and serious fire fighting experience fades away. After a time, usually about 10 years, the first unstoppable fires start to occur, and before there is time or the energy to get the system back on the rails there is another disaster. The cycle then begins again.

The IFA notes that California is currently in the disaster phase of the cycle. Victoria, NSW and ACT are currently in the inquiry and redesign phase. WA is just coming to the end of a complacency phase, with the first big unstoppable fires in decades occurring last summer.

3.6 Social pressures at the urban fringe

This issue is made worse by demographic changes to Australian society, especially our increasing urbanisation which in turn is leading to people losing touch with the reality of the bush. At the same time, growing numbers of city-people are drawn romantically to the bush, and are seeking a lifestyle at the urban fringe, surrounded by tall trees and dense bushland. Every Australian city has new residential developments of this sort, where inexperienced people are being placed in situations of great vulnerability to fire. Not only do these people not understand the threats around them, many have been indoctrinated with the old European view that “all fire is bad”, and actively oppose the work of fire managers trying to reduce fuels by prescribed burning so as to minimise the risk of the inevitable disaster a few years hence.

A great many Australia urban people have been led to believe that ecosystems are threatened by the periodic low-moderate intensity fire which is used in hazard reduction work. This view is not supported by credible ecological research. On the contrary, the Australian bush is very resilient to occasional fire. Burning operations, with the input of ecologists and the careful management of ignition patterns, can accommodate the requirements of any fire vulnerable species and vegetation types.

By far the greatest damage arising from the high intensity 2002/3 fires has been to the soil, with post-fire erosion silting up waterways and reservoirs, and to wildlife where untold millions of animals have been incinerated, or have lost their habitat.

Large high intensity bushfires in water catchments have a “double-whammy” impact:

- The immediate effect is increased run-off, but this is associated with heavy sedimentation, siltation of streams and pollution of reservoirs with ash;

- The longer term effect is the replacement of older trees with even-aged regeneration right across the landscape, the effect of which is to reduce recharge to aquifers and run-off to streams. Thus fresh water supplies are always degraded and reduced by large high intensity bushfires.

This impact is never mentioned by opponents to fuel-reduction burning. And although there has been decades of research into the impacts on wildlife of low-moderate intensity prescribed burning, almost nothing is known about the long-term changes to biodiversity following very large high intensity fires.

Governments need to educate the community and politicians about the role of fire in Australian ecosystems. There is a need to strongly put the case that the consequences of making a deliberate decision not to introduce fire to an area of bushland are at least as profound as deciding to apply planned fire at some time under particular conditions of fuel, weather and ignition pattern. This is a message that needs to start to be delivered to pre-primary children and emphasised throughout the education system.

The IFA acknowledges work done by some rural firefighting authorities at the urban fringe. They have introduced some excellent programs such as “Community Fireguard”, and they have tried to influence planning decisions and educate residents in household defence. To some degree this work can be credited with the fact that the loss of life in the major bushfires that have affected the ACT, New South Wales and Victoria in recent summers was much less than in the 1983 Ash Wednesday bushfires. However, the IFA points out a significant difference between these events. Ash Wednesday was basically a one-day event, which caught people by surprise and gave them no time to marshal resources or retreat to safety. The recent fires in NSW and Victoria on the other hand, and especially the very damaging ACT fires, had been burning for days, in some case weeks, before they threatened towns and settlements. This gave ample time for last minute defences, and for mounting emergency work directed at saving lives. Furthermore, in Canberra there are excellent road systems which allowed rapid egress from the fire – a situation not found in bushland around most of Australia’s capital cities or large rural towns.

3.7 Looking ahead if nothing is done

The IFA has the view that the disasters of 2002/3 will be repeated summer after summer into the future unless fundamental and lasting changes to bushfire management in this country are introduced. The inevitable results of failure to make changes will include:

1. On-going loss of private property and assets (buildings, fences, stock) and public infrastructure (power supplies, bridges, roads);
2. Destruction of the old-growth forests set aside in reserves, and of the associated wildlife, including endangered species which could not be protected from high intensity fire;
3. Degradation of forest soils, increased erosion rates and pollution of water supply reservoirs and waterways, increased water treatment costs, reduced fresh water supplies;
4. A large and growing burden on State and Federal budgets for the costs of firefighting, and for restoration of infrastructure lost in fires and disaster relief;
5. Significant social and economic impacts on rural communities dependant on value-adding of agricultural and forest crops destroyed by fires. Regional wood processing industries are particularly vulnerable to fire losses due to the long crop replacement lag times, especially with pine plantations;
6. Significant increases in fire insurance premiums; and
7. Loss of lives, especially those of firefighters forced to tackle bushfires of increasing intensity in long unburnt forests, and of people living at the urban-rural fringe who have been misled by the ideologists into opposing burning for community protection, or who fail to learn basic messages about bushfire survival.

Specifically, we predict that if the situation is not addressed and significant changes made, it is inevitable that there will be a further increase in the occurrence of high-intensity bushfires burning in and out of Australian forests and woodlands. In our view there is no aspect of Australian society or of most Australian ecosystems which benefits from large high-intensity bushfires.

3.8 Best practice

Foresters are readily able to define a best practice bushfire management system. Such a system is one which

- Delivers protection of community assets and human values from destructive bushfires;
- Avoids or minimises undesirable long-term environmental impacts;
- Takes into account the need to ensure the safety of firefighters;
- Ensures that fire use and fire suppression are based on credible science, allowing protocols and prescriptions to be continually updated in the light of research and field experience;
- Makes provision for independent monitoring of outcomes, and for public reporting;
- Puts continuing resources into research and research transfer; and
- Has community and media support, stemming from strong political leadership and a high level of public understanding of the issues.

Such a system will have a number of critical and interlocking elements, for example:

- agreed and linked policy at Federal and State levels setting out objectives, strategies and performance standards, and making a clear statement on accountability for outcomes;
- up-to-date legislation;
- a clear statement of responsibilities for bushfire planning and management;
- effective community education programs;
- a strong and on-going commitment to research, with input to research priorities from fire and land managers;
- some form of independent monitoring and public reporting on outcomes, focusing on prevention and mitigation, not just suppression; and
- funding arrangements which reward effective, not failed management.

The problem in bushfire management in Australia is not that a best practice system cannot be developed; it is how to get it implemented. To overcome the obvious constraints, strong and cooperative leadership is required. In recent decades this has been lacking, or has been undermined by environmental activists who are themselves not threatened by fire, or not accountable for the outcomes of fire management programs.

4. Review and recommendations

The IFA wishes to raise 8 critical issues and to make recommendations on them to COAG. Each of the Committee's inquiry terms of reference is covered.

4.1 Policy and best practice

Australia needs a National Bushfire Policy.

At the moment there is no national policy, although the Australasian Fire Authorities Council has produced a "position" on bushfire management which is comprehensive and strategic in outlook. It does not bind States or agencies. Each of the States has a mishmash of policies – in some cases, there are three separate policies within the one state, for example one for State forests, one for National Parks and one belonging to the Emergency Services. In some cases the separate policies between and within different states do not dovetail with each other; in many cases they are contradictory. Private plantation companies, who now own most of Australia's plantation resource, are not represented anywhere in bushfire policy development. This situation is further complicated by the fact that many Local Governments also have some sort of fire policy or fire prevention plan, in many cases developed independently of every other organisation or land management agency.

The IFA believes that COAG must take a leadership role in this issue. The States and the Federal government need to be brought together to identify the structure and directions of a national policy and agree on the way it should be implemented through the definition of a best practice bushfire management system. The Federal government should consider this as a condition for providing funds for fire management, including firefighting. We appreciate that this approach will be fiercely resisted by the States, and by individual agencies within States who wish to have and implement their own parochial policies. This should not prevent the approach from being adopted.

At the same time the IFA points out that since the demise of the former Forestry and Timber Bureau, the Commonwealth Government has had almost no professional forestry expertise within the Commonwealth public service, apart from that of CSIRO research scientists. The lack of practical knowledge of bushfire management at federal level is a severe shortcoming, militating against the development and application of policy.

A National Bushfire Policy and best practice bushfire management system should embrace the following essential elements:

1. Objectives for bushfire prevention, mitigation and management
2. Responsibilities for fire prevention and suppression work;
3. Accountability for outcomes;
4. Cooperative arrangements between jurisdictions;
5. Funding arrangements;
6. Research;
7. Community education;
8. Training of bushfire managers and firefighters;
9. Fuel management;
10. Access within forests;
11. Independent monitoring of bushfire management by States and agencies;
12. Public reporting;
13. Maintenance of a bushfire database; and
14. Establishing mechanisms for policy review and updating.

We recommend that COAG take the lead in formulating a National Bushfire Policy and assume an ongoing role in its implementation.

4.2 Bushfire risk factors and risk management

Causes of fires

Australia is naturally a bushfire prone country. There are two causes of all fires: lightning and humans. Neither will go away.

The frequency of lightning caused fires is irregular and unpredictable. The only things of which we are sure is that they will happen, and often when they do, they will come in large numbers at about the same time, or spread over a few days, and they are often associated with adverse drought or weather conditions.

Although data on deliberately lit bushfires (arson) is poor, the number of such fires appears to be increasing. In Tasmania, for example, 60% of all wildland fires are now attributed to arson. The reasons for this are not well understood. One factor noted by experienced bushfire managers is the wide disparity between alleged and confirmed cases of arson. Moreover, often where people do not know what has caused a fire, or where there is denial about the relationship between lightning and bushfire ignition, people simply say “arson”. These factors confuse the available data. Improved fire investigation and research is needed. However, arson has existed since mankind has existed – it will always be a cause of fires, and land managers must accept this, and plan for it.

Fire impact

The impact of bushfires is directly related to the intensity of the fire (i.e. the rate at which energy is released, usually expressed in terms of kilowatts per metre), and to the size of the fire. A mild trickling forest fire of low intensity has little killing power, is easily suppressed and the impact is slight and temporary. But the range of possible intensities is almost infinite. As conditions escalate, so does intensity, and at the extreme end of the scale, the intensity of a bushfire can be immense, i.e. capable of generating cyclonic winds, uprooting huge forest trees and carrying spot fires for many kilometres. The

following table demonstrates the range of bushfire intensities, with comments on the impact and difficulty of suppression:

Fireline intensity (KW /m)	Impact	Suppression Difficulty
20-500	Low intensity, patchy burn (the intensity prescribed for most fuel reduction burns). Rapid recovery of ecosystems.	Direct attack relatively easy
500-1700	Moderate intensity, little damage to ecosystems	Direct attack usually succeeds, but headfire must be “pinched in” from the flanks

1700-3500	Medium intensity, trees are killed, no or few unburnt patches	Direct attack not likely to be successful on head or flank fires
3500-7000+	High intensity, extensive and long-lasting damage to ecosystems	Crown fires occur – suppression impossible
20,000-60,000+	Extreme fire behaviour – ecosystems wiped out	Mass fires, firestorms – suppression impossible

The intensity of a fire is influenced by three main variables: the heat of combustion of the fuel, the speed of the fire and the fuel consumed. For practical purposes the heat of combustion of natural fuels can be considered constant; the speed of the fire is determined by the weather and the fuel; while the fuel consumed is determined by the total available fuel and the intensity of the fire.

Weather cannot be controlled by forest managers, but fuel levels can. This is the rationale for the use of “prescribed” fire (i.e. fires lit deliberately under carefully prescribed conditions) to reduce the level of fuels in the forest, and thus reduce the intensity of a subsequent fire and, as a feed back mechanism, further reduce the fuel consumed.

An extensive series of experimental forest fires (Project Vesta) has been conducted over the past 5 years by the Western Australian Department of Conservation and Land Management and CSIRO Forestry and Forest Products to examine the question of how fire behaviour is affected by the age of the fuel.

These experiments have clearly demonstrated that all of the major fire behaviour variables that contribute to the difficulty of suppression (i.e. rate of spread, flame dimensions, spotting) increase as the age of the fuel increases.

In many forests the accumulation of shrub and bark fuels (that add to flame heights and spotting potential) continue to increase after the surface fuels have stabilised or reached equilibrium. Nevertheless, in older and heavier fuels, fires are always harder to control and do more damage.

The value of prescribed burning to bushfire risk management

The IFA considers that fuel reduction burning is the most important tool in the hands of Australian bushfire managers whose objective is to minimise the occurrence of “killer” bushfires. Thus, the primary problem in bushfire management in Australian native forests today is the failure to undertake prescribed burning programs for fuel reduction (and for other purposes), or at least to ensure that such programs are adequate and effective. Prescribed burning has several benefits:

The first benefit, critical under extreme fire conditions, is that it reduces the “crowning” and “spotting” potential of uncontrolled fires. Crown fires are of great concern because (1) they escalate the level of damage, especially in wet sclerophyll forest; and (2) they are very threatening to the safety of firefighters. The spot-fire phenomenon causes firebrands, usually burning strands of bark, to jump containment lines and create multiple fire ignitions in adjacent unburnt forest. The number of spot fires and the distance they travel increases with increasing fire intensity. This is the process that leads to the point at which fire suppression effort becomes useless – i.e. the point at which the number of spotfires exceeds the capacity of the fire fighting forces to safely find and suppress them.

When forests are not burned for long periods, not only is there a heavy build-up of surface fuels and shrubs, but also there are abundant accumulations of bark on the trunks or suspended in the upper branches and the intensity that limits fire suppression is reached under relative mild weather conditions. After the initial lighting-caused ignitions of the 8th January 2003 in the mountain forests of the ACT, southern NSW and Victoria, spot fires were a significant factor in the breaching of containment lines during an unprecedented summer period of 10 days of mild weather with easterly winds. These fires would have been effectively contained, and firebrand spotting reduced, had strategic hazard reduction burning been routinely carried out in previous years. When extreme fire weather conditions occurred on the 18th January 2003, firebrands travelled many kilometres from native forest and started spot fires in the pine forests and grassland surrounding Canberra. Mass spotting between the fires and their coalescence contributed to the fire storm that destroyed so many houses in the suburb of Duffy. Further spotting carried the fire into and across the southern suburbs of Canberra.

A second important benefit of prescribed burning is a reduction in the quantity and distribution of fuel within the forest. This reduces fire intensity, crowning and the severity of damage to the forest itself, especially old trees, as well as to adjoining life and property. Furthermore, areas of reduced fuel offer refuge areas for firefighters and are a major safety factor.

Prescribed burning also has a vital role in the maintenance of the health and vitality of forests and woodlands. This can occur as a result of fire-stimulated regeneration of plant communities and associated fauna habitat. Skilfully applied, prescribed burning can also be used to maintain mosaics and natural ecological boundaries within the landscape. These subtle features are at risk of being lost due to successive large scale fires of high intensity that leave no corner of the landscape unimpacted. Even though large areas of Australia's forest and woodland are now managed primarily for conservation values there is still an essential need to manage fire regimes through the planned application of fire. This point is highlighted in a 2002 report prepared by the Fire Ecology Working Group of the Victorian Department of Natural Resources and Environment which demonstrated that the majority of vegetation associations found on public land experienced fires less frequently than required to maintain a balanced distribution of age-classes. These vegetation associations could in fact be threatened by under-exposure to fire, rather than by the commonly-perceived threat of too-frequent burning.

Finally, prescribed burning programs help to familiarise staff with the use of fire, and to train them in fire behaviour and bushfire survival. Personnel with long experience in undertaking well planned burns, generally make better and safer firefighters.

Despite all the evidence to the contrary there persists a misguided view by some academics, and officials in some Australian agencies and emergency services that such burning is bad for the environment and that it does not assist in fire control and suppression under severe burning conditions. This position is supported by urban-based environmental groups whose motivation is political influence, not good science or community safety. We believe that the denial of the value of hazard reduction burning is a major factor contributing to the reluctance of some conservation agencies to fully implement their legal responsibilities to control the fire hazard in their management areas.

The IFA does not have access to Australia-wide data on prescribed burning targets and achievements by agencies with responsibility for national parks and forests. We have, however, reviewed data for WA, Victoria and NSW, and in each case there has been a decline over recent years in the areas of forest in which fuel reduction burning has occurred. In WA, for example, less burning was done in the 2001/2 fire season than in any year since 1960/61, and in no year in the last 5 has the annual burning target been achieved. Failure to undertake burning has a simple and obvious outcome: fuels are accumulating and future fires will be more intense, more difficult to control, more dangerous to firefighters and more damaging.

As made clear in our policy documents, the IFA does not advocate a "scorched earth policy". We view well-planned hazard reduction burning as being entirely consistent with the ecological integrity of almost all Australian forest landscapes. Indeed, in the absence of traditional Aboriginal burning it is a highly desirable mechanism to maintain most of our forest ecosystems. At the same time we emphasise that hazard reduction burning must be professionally planned and conducted, take into account all values, and there should be associated monitoring and research programs. Independent audit of targets, performance and outcomes is essential.

The aim of a prescribed burning program is NOT to prevent fires occurring, as some people mistakenly observe. Accepting that ignition is inevitable, the aims are to

- Reduce fuel loads to levels that moderate fire intensity and therefore ameliorate fire damage to life, property and the environment, even under extreme conditions.
- Enable easier and cheaper fire suppression.
- Reduce the risks to firefighters.

Areas previously subjected to hazard reduction burning do burn again, but in lighter fuels firefighters are not exposed to the same level of danger from intense fire behaviour, and can more easily and safely extinguish fires at a much higher level of fire danger. Any minor environmental damage as a result of hazard reduction is clearly more preferable to the almost complete destruction of living material that occurs as a result of fires burning over large areas under extreme conditions in fuels that have not been hazard reduced for a very long time (15 years or more).

The IFA draws to the attention of COAG the fact that anyone can light a fire and burn off. However, the operation of prescribed burning to meet multiple objectives has been backed by extensive research and is a professional activity that should be planned and supervised by skilled land managers.

The technology for broad-area aerial prescribed burning for hazard reduction in fire-prone plant and animal communities in Australia was first operationalised over thirty years ago. In all States there exist systems of setting objectives for burning, burn planning and monitoring outcomes. These systems are known to provide an effective means of adaptively managing fire on an ecological basis. The severity and extent of the recent bushfire catastrophes, however, are testimony to the lack of ongoing application of this technology, and to the ignoring of professional advice from people skilled in fire management.

The IFA is well aware that hazard reduction burning is easier in dry than in wet sclerophyll forest, and in some wet sclerophyll forest types hazard reduction burning is not appropriate. Inappropriate burning (i.e. too frequent, too cool, too hot, in the wrong season for a particular ecosystem, in regenerating forest etc) is not condoned. Some forests, such as cypress pine, some inland eucalypt woodlands and rainforests should not be burned, nor is it desirable to burn most plantations. All burning plans must incorporate advice from ecologists, and the impacts of burns should be monitored. Burning programs must be carried out under the direction of skilled and professional fire managers (who are an increasingly scarce resource in some agencies), and be accompanied by effective training programs.

It is also true that many of the States' agencies are more or less advanced in the development of basic fire behaviour information. In some States, principally WA, there are excellent fire behaviour models that allow precision burning to be conducted. In other States there is an urgent need for research to develop new fire behaviour models to enable precision burning in a range of fuel types.

We are also well aware of the effectiveness of campaigns directed at politicians and agency staff by groups who oppose the practice. Unfortunately this has become enmeshed with opposition to some other activities, such as timber cutting and the expansion of plantations, and is part of an ideology which is increasingly becoming institutionalised in some agencies in Australia. In this situation, policy is uncoupled from science, and Duty of Care to the environment can override Duty of Care to the community, ironically resulting in perverse environmental consequences.

We are aware of the issue of smoke. Burning generates smoke and despite efforts by forest managers to avoid or minimise this, smoke from hazard reduction burns can drift over urban areas. Here it is perceived as air pollution, rather than a natural and inevitable consequence of land management in Australia. Modern urban Australians have low tolerance for bushfire smoke and the resulting regulatory measures have placed severe constraints on forest managers. Unfortunately regulators discriminate against human-caused, as opposed to "natural" (i.e. wildfire-caused) smoke. This in turn has led to important community protection burns being cancelled or permanently postponed. It is essential that State and Territory Governments accept that such events are ephemeral, natural to the Australian environment and far preferable to the smoke impacts of large wildfires. Regulatory frameworks regarding air "pollution" need to be revised.

Finally, the IFA does not regard fuel reduction burning as the panacea for bushfire problems in Australia. It is one tool among many. But it is the most critical tool available in the prevention of high intensity

“killer” fires in native hardwood forests, especially the dry eucalypt bushland surrounding most of our major cities.

The ecological consequences of excluding fire

Environmentalists and academics opposing the periodic burning of Australian forests do so in the belief that it will result in serious environmental problems. The litany of outcomes includes loss of endangered species, reduction in numbers of plant and animal species, loss of soil fauna, loss of nutrients, air pollution, increased weeds, and increased predation. Curiously, opponents of burning programs do not consider the alternative, i.e. the ecological consequences of large high intensity bushfires, which are the inevitable consequence of long periods of fire exclusion.

The IFA has studied the research associated with impacts of various fire regimes, and in particular the theoretical relationships between some endangered species and fire. We conclude that the best overall outcome for biodiversity is achieved by a diverse fire regime applied across the landscape, and the best way to achieve this is by deliberate planned use of fire over many years, not by allowing single-event huge and high intensity fires which take out whole landscapes, even regions, at the one time.

The critical thing in our view, is not to exclude fire, but to ensure that fire is used properly, with attention to varying the time between fires, fire intensity and season, and if necessary making special provisions in the case of any endangered species where endangerment is clearly identified as being associated with fire, rather than some other feature.

Wilderness

A further bushfire risk factor in many forest areas in Australia is the declaration by State governments, of “wilderness areas”. These are areas usually remote from settlement and firefighting resources, and with poor or no access or where access roads have been deliberately closed or fenced off. It has become common for little or no fuel reduction to be carried out, on the grounds that deliberate burning interferes with nature (i.e. the situation which prevailed *before* Aborigines came to Australia 60,000 years ago). In these areas bushfires will inevitably start by lightning.

A fire left to burn “as nature intended” can reach a significant size, and if severe weather eventuates, become unstoppable. Even if the decision is taken to attack fires starting in remote wilderness areas there is a long time-delay between fire detection and attack, especially if access is poor. Remote area fires can be attacked and suppressed successfully in low fuels and mild weather. Water bombing aircraft can play a particularly useful role if rapidly deployed to remote fires, but they will not extinguish fires in heavy fuels, and must always be followed up by on-ground forces who need to construct a bare-earth break around the fire edge and mop-up smouldering material.

Direct fire attack with bulldozers is essential if the fire exceeds a few hectares but without good roads machines must make their own access to the fire. Indirect attack involving back burning is an uncertain and hazardous undertaking in wilderness areas. If the road network is sparse, such a large area is committed to the back burn that it may be impossible to burn out the entire area and make the perimeter safe before the severe weather conditions occur. A large number of bulldozers are often required to laboriously open abandoned fire trails - usually more than are available in any jurisdiction at the one time.

Under bad fire weather conditions, fires in remote wilderness areas can become very large very quickly, can coalesce and can result in massive fires driving out into State forests, plantations, country towns and even suburbia. The IFA is alarmed about the trend by Australian governments to deliberately create such wilderness areas without effective fire management strategies or the recognition that without effective fire management large wildfires will not be able to be confined within the wilderness areas. This follows from the facts that in wilderness areas (1) lightning-caused fires are inevitable; (2) fuel reduction may not be carried out; (3) road access is closed or minimised; and (4) early attack and containment of fires is often impossible under even moderate weather conditions where there are heavy fuels.

The IFA is not opposed to the designation of wilderness areas. However it strongly advocates that agencies managing such areas must have realistic options for suppressing wildfires within them. Indeed, these areas should demand the heaviest attention to wildfire prevention management. Options must include the ability to rapidly deploy adequate numbers of ground and aerial firefighting resources, and must require implementation of ongoing programs of strategic prescribed burning and maintenance of

roads and tracks which could realistically be used to conduct large scale indirect fire suppression strategies.

Fire suppression versus fire prevention

Finally COAG needs to be fully aware that expensive fire fighting technology and equipment, essential as they are, will never be the sole answer to tackling large intense forest fires. Under conditions which occur regularly in Australian forests, and especially where the fuels are long unburnt, bushfires will always occur in the size, number and intensity capable of overwhelming the best equipped firefighters. To give these forces a chance of success, they must have extensive, strategically placed fuel reduced areas, coupled to a rapid fire suppression capability. The “stand-and-defend at the edge-of-the-forest” approach will never succeed against high intensity fires driving out of heavy bush.

We recommend that COAG rejects the view that well planned prescribed burning is dangerous to the environment. On the contrary we advocate that the Committee agrees that the real environmental damage resulting from large high intensity fires can be minimised by low intensity ones. COAG should sponsor the outcomes of the Project Vesta research and the transfer of this technology to State agencies, and should provide financial support for further fire behaviour studies and the development of precision prescribed burning guides for all major dry sclerophyll forest types. Further research is also needed into the health impacts of bushfire smoke and promotion of public education on this issue.

States should be asked to review fire management in wilderness areas, and to provide revised plans where bushfire damage is found to be inevitable.

4.3 Alternative bushfire mitigation and prevention approaches

The essential bushfire statistics for a given land tenure are records of fire number, location, size and intensity. These things affect the level of damage and the ease/difficulty/cost of suppression. Time-series records of fire statistics such as these provide the raw information on which fire managers can prepare and update Fire Management Plans for an area.

All forested areas in Australia should have a Fire Management Plan, based on the public policy, updated annually, endorsed by local community stakeholders and bushfire experts, applying to both private and public organisations, setting out the priorities for protection and providing the blueprint for annual programs of preparedness, prevention and suppression. It is a fundamental tool, the link between policy and action on the ground. Fire Management Plans need to be supported by systematic independent audit of outcomes and (in the case of agencies responsible for public lands) an open reporting process.

When it comes to preparedness and suppression activities, there is general agreement on what should be done, but not on the need for implementation. On the whole this work is well done by Australian land management agencies, but improvements can always be made. In particular, there is a need for a more consistent approach to bushfire preparedness, matching suppression response capability with risk, and multi stakeholder response protocols. Real time monitoring of fire risk across the landscape using GIS systems on a daily basis, and deployment of suppression forces in direct proportion to this risk is world best practice that is not yet being utilised in Australia. Fire preparedness planning tends to be *ad hoc*, and is generally limited to State forest agencies and private plantation companies who have complete control over the fire risk value chain from prevention, through presuppression planning and resource deployment, and suppression response.

Bushfire mitigation and prevention is not generally well done anywhere. There are three significant problem areas: (1) lack of accountability, (2) lack of hazard reduction; and (3) ineffective community education resulting in apathy and/or opposition to bushfire mitigation work. [The problem associated with uncontrolled residential expansion into bushland in the outer suburbs has already been discussed, and that of roads and access will be discussed below].

1. Across Australia, little attention is given to accountability for bushfire mitigation and prevention. The critical elements are as follows:
 - At the Commonwealth level, and in each State and Territory there should be one Minister who is clearly accountable for bushfire outcomes;
 - In each State there should be a single organisation responsible for seeing that the State’s bushfire policy is effectively implemented;

- In respect to their bushfire responsibilities, land management agencies must have clear objectives and priorities, and a set of performance measures and targets set out in a Fire Management Plans (as described above);
- There must be a process for independent audit and public reporting on the implementation of Fire Management Plans and bushfire outcomes.

At the moment it is very hard for anyone to know whether or not bushfire mitigation and prevention work has been done and to what standard. Independent auditing of bushfire preparedness and prevention is almost never done, other than as an inquiry in the wake of a disaster (although the IFA is aware of a major study by the Victorian Auditor General in 2002 and of a current study by the West Australian Auditor General in WA). Furthermore, if the work is not done or not done properly, no-one is held publicly accountable. Certainly there are no unfavourable comments in Parliament or the media, and money is always available to fight fires and for disaster relief, even for a bushfire which could have been prevented. This is the reverse of accountability: States that have not developed and implemented responsible fire management systems are actually rewarded by an inpouring of funds to fight fires and restore post-fire damage.

Related to the lack of accountability is the growing enthusiasm for high-cost, high media-value, jazzy suppression tools, such as air crane helicopters. Although it is true these machines do good work in some situations such as at the urban interface, they are not a replacement for solid fire prevention work by skilled crews on the ground.

Even in considering aerial solutions, air cranes are not necessarily the most cost effective. In some situations, if local aerial contractor resources are effectively harnessed, a large number of geographically distributed small-medium scale air attack options (either fixed wing or helicopter) could be rapidly deployed to significantly suppress fires while they are still at a controllable size.

2. As already discussed, the only practical way to reduce the size and intensity (as opposed to their number and location) of bushfires in the native forests is to reduce fuels in the forest before a wildfire starts using a responsible program of prescribed burning. Although most States have policies that include the need to reduce fuels by burning, at the moment nowhere in Australia is such a program being implemented to the extent necessary. What's more, mostly no-one cares outside the small number of people who have to actually fight fires when they start.
3. The Australian community as a whole is poorly informed about bushfire threats, fire prevention measures and action taken in anticipation of a fire. The influence of fuel loadings on fire intensity, the speed at which a fire can move once it starts to spot, the inability of garden hoses to stem a fire front, basic fire survival and safety, appropriate building design in fire-prone environments etc is to many Australians a foreign language..

Community education programs are expensive, and need to be professionally designed and conducted. The message needs to be consistent. Message "take-up" needs to be tested. This work needs to be funded and organised by government.

The IFA recommends that COAG review the bushfire mitigation and management systems developed by States and Territories to ensure that they effectively identify accountability for outcomes, fuel reduction in forests and community education.

4.4 The appropriate direction of research into bushfire mitigation and management;

It is essential that Australia is at the forefront of bushfire research, and that there are active programs in the States and supported by the Commonwealth. The initiative to establish a bushfire CRC is endorsed, but the CRC will need to be seen as *an additional resource*, not just a repackaging of current research. Critical areas of study must include work in five fields: (1) fire behaviour; (2) fire effects; (3) fire operations (prevention and suppression); (4) fire detection and monitoring, and (5) minimising fire impacts. A key objective for fire behaviour research must be the development of burning guides for forest fuel types across the nation.

Decisions about research programs and priorities should include input from bushfire specialists and land managers, through some structured approach.

It is also essential that research organisations have the capacity for effective transfer of new knowledge to fire management organisations, especially in the use of capital intensive technologies such as remote sensing. This aspect of research is often overlooked and under funded.

The IFA recommends that COAG push for increased resources for bushfire research in Australia, including technology transfer and for a structured approach to determining research priorities.

4.5 Planning and building codes with respect to protecting life and property from bushfires.

Research since 1944 into house losses in bushfires has shown that the type and structure of the building has little impact on the loss of houses. A few simple and well-known precautions have to be taken. Sparks have to be prevented from entering the structure by good maintenance and screening of windows and vents; air-conditioner fans must be turned off; gardens and immediate surrounds have to be maintained in a non-flammable condition; adjacent bushland and forest have to be managed and fuel reduced to prevent high-intensity fire; and able-bodied persons must be present to suppress ignitions from sparks in and around the buildings when they occur.

The current situation is an impasse where Councils and developers are keen to place as many houses as possible on the available land with the least possible set-back from flammable vegetation, particularly where houses are adjacent to national park or forest tenure. Residents want to have a lifestyle that places them in close proximity to dense bushland to the extent that in places they have extended their native gardens out into the adjacent vegetation. Yet bushfire agencies are expected to provide protection! In some respects the development of building codes is providing a false expectation that councils and developers can put houses closer to flammable vegetation and that residents do not have to take responsibility for undertaking sensible fuel management in their gardens or surrounds.

As in the forest the key to protection of individual properties is fuel management and the IFA believes that loss of houses will continue unless individual homeowners take responsibility for their own protection throughout the year, not just at the last minute when a fire threatens.

The IFA also notes that many Local Government planning regulations limit new commercial plantation developments close to existing domestic housing, but no limitations are placed on new housing developments close to existing commercial plantations or bushland areas.

The IFA recommends that COAG pushes to have a National Code for residential areas and buildings in bushfire prone areas, that is based on good sense and good science and specifies minimum clearing distances from tall vegetation and advice about hazards in home gardens, and is consistent in respect to residential development and plantation development.

4.6 Bushfire mitigation and response arrangements and costs

Agencies responsible for management of forests and woodlands also have an obligation to manage fires that occur on those lands. This means providing adequate resources for fire prevention, pre-suppression activities, and for fire suppression (as well as essential but ancillary activities such as research, law enforcement, and community education).

The adequacy of bushfire response arrangements is not an absolute value. Current arrangements are probably adequate to deal with the bushfire situation in most parts of most States in most fire seasons. No current arrangements are adequate to deal with multiple high intensity fires, as occur every decade or so. Nor are current arrangements likely to remain adequate into the future if the levels of hazard reduction burning continue to fall, because of the fact that as fuel quantities grow, higher intensity fires are able to occur in milder weather conditions.

The IFA notes with great concern six factors are cumulatively reducing the adequacy and effectiveness of Australian fire fighting resources:

1. Australia-wide, the number of permanent experienced personnel and skilled firefighters in land management agencies is steadily declining and their ages are increasing. Also, the agencies and emergency services are becoming more and more reliant on volunteers to fight fires.
2. The massive reduction in the Australian hardwood timber industry in NSW, Victoria and WA in the last 5 years has led to a significant decline in the number and availability of earthmoving equipment used in the past for firefighting.

3. Standards of road maintenance within forests, and general levels of access to forests have declined, especially in areas transferred from multiple use forest with a timber production emphasis to conservation reserves. Declining road maintenance is partly a result of policy decisions (i.e. declaration of wilderness areas) and partly a result of lack of funds or clarity on maintenance responsibility.
4. The Commonwealth government is currently withdrawing VHF fire ground frequencies away from fire authorities for commercial sale to other users leaving fire ground communications severely limited. Coupled with this all states are choosing communication systems with no cross-border capacity, and even no operational capacity outside the range of their respective state repeater networks.
5. The usefulness of rapid first attack strategies using a combination of aerial fire bombers and ground resources on some types of private land is under-rated. For the last seven years, aerial fire bombers deployed in the Mount Gambier area on a risk-related basis have clearly demonstrated that fires in high value plantations and agricultural crops can be extinguished under extreme fire weather conditions. This is only possible when fires are rapidly detected and strategically located ground crews are able to respond to all fires within 20 minutes.
6. Fire risk management is most effective when a single organisation is responsible for prevention, presuppression planning, mitigation and suppression, especially on lands under its management control. Most volunteer fire authorities focus only on suppression response (often this is set out in their legislation). In this scenario, responsibility for prevention is “someone else’s job”, and good coordinated bushfire prevention slips through the cracks between various agencies.

All of these trends are occurring at a time when fuel loads in the forests are growing.

Technology has marginally counterbalanced this situation. For example, under favourable flying conditions, water bombing aircraft and helicopters do a wonderful job at the urban interface, in plantations where they can be rapidly deployed, and can help to “hold” small forest fires under mild conditions in remote areas. Overall, however, there is no question that our current resources are inadequate to deal with multiple intense fires under bad weather conditions, and the potential for such fires is increasing. Furthermore, in the absence of fuel reduction programs, there will always be situations in which there are not enough resources to deal with multiple fires on a bad day.

There is also the question of costs. The move toward greater emphasis on fire suppression in recent years has resulted in large investments in very expensive aerial equipment. Because such equipment is there, it is tempting to use it even if far cheaper ground-based methods are adequate for the purpose. As a matter of principle, the IFA believes that it is far cheaper to expand fuel reduction burning programs (especially in dry sclerophyll forests) than to rely on expensive equipment that has limited use when it really matters during fire emergency periods. For example, it has been estimated that the Canberra fire storm could have been avoided by a series of fuel reduction burns costing maybe \$200,000 per year. The total cost of the Canberra disaster is in excess of \$260 million. Although to some this may appear to be a simplistic equation, we believe that the nation cannot continue to bear such huge costs and point out that the financial analyses do not also include the human costs of such disasters.

The IFA’s fundamental position is that these disasters do not need to happen. They are not inevitable, or simply the result of the drought as some commentators have suggested. Bushfire disasters can be avoided by consideration of the sorts of things raised in this submission, in particular community acceptance of the need for a far more comprehensive fuel reduction burning program, nationally, as part of a holistic approach to bushfire management.

The IFA recommends that a National Bushfire Policy clearly state that community protection from wildfire remains the prime objective of bushfire management policy in all jurisdictions and that the cornerstone of all fire management should be fuel reduction burning.

4.7 Fire management resources

There has been a major downsizing of the permanent workforce in Australian forestry agencies in recent years, and mostly this has not been accompanied by equivalent replacement when forest lands are transferred to national parks. This means that there are now inadequate resources available for fire prevention and bushfire mitigation or for rapid and effective initial attack across most of the forest zones of the nation. Increasing reliance on volunteers to carry out suppression means there is an inevitable

delay between fire detection and attack. Longer response times mean that firefighters are missing the opportunity to attack fires when they are small and easiest to suppress. Moreover many volunteers are not trained or fit enough for direct attack on fire edges with hand tools. This is tough, arduous work but an essential part of efficient fire suppression. Some States have employed specialised crews of summer firefighters who are required to pass accreditation standards for physical fitness as well as training. These programs are worth pursuing. However, the employment of fire-fighting crews does not address the problem of resources needed for fire prevention and fuel reduction work, which is normally carried out in the winter, spring and autumn.

The IFA believes that on the whole, resource-sharing in fire emergency situations is being reasonably well done in Australia, although there are a number of minor issues which need to be overcome through improved liaison between agencies and States. One issue which needs to be examined in more detail by COAG is the cross jurisdictional arrangements that exist for both fire prevention and fire suppression operations between NSW and the ACT. The IFA is not aware of any significant co-ordination of fire prevention planning between these two jurisdictions and considers that co-ordination of suppression operations across this artificial boundary could be significantly improved.

There has been a growing tendency for firefighters to move interstate to provide assistance to each other, in an emergency and this is a good thing. The efficiency of interstate movements would be improved with further standardisation of equipment, communications and incident control systems. Incompatibility of communication systems is a major impediment in cross-border situations. Australia urgently needs federal government commitment to national VHF fire ground radio frequencies enabling various fire agencies to safely share the resource.

Antagonism between agencies is a factor in some areas. It is hard to see how this can be reduced in a climate where there is overall lack of agreed objectives and where completely different policy approaches apply. Until governments get together and sign-off on an agreed policy, starting at the national level, agencies will be free to go their own and frequently divergent ways.

A key issue is the number of skilled and experienced firefighters. Clearly higher numbers and more experience become even more essential when forest fuel levels are higher and less is required when fuel loads are adequately managed. It is a question of a proper balance between the two. The experience with fire gained in fuel reduction burning is a priceless preparation for fighting wildfires. There are related and serious questions about the aging and loss of fire commanders from many agencies, which is not being accompanied by necessary levels of recruitment.

Firefighters in Australia now also must be able to move across State and Territory a boundary, which in turn requires some knowledge of how bushfire management is organised in the different jurisdictions. This suggests the need for a national program of bushfire leadership training.

Another important factor in the deployment of resources is ensuring that maximum use is made of suitable weather for prescribed burning. At present, lack of trained personnel at the critical time, or other priorities often prevent prescribed burns being done at a time when conditions are perfect.

Effective bushfire management in Australia will only come about if all the various land management and emergency services operating in different ways on different tenures can be made to work cooperatively. The start-point for this is shared policy, i.e. top-down agreement on principles, philosophy, priorities and practices. At the moment we see cooperative arrangements coming from the bottom-up, i.e. sharing of firefighters. Both approaches are needed.

The IFA draws the attention of COAG to the excellent model developed in Tasmania where a State Fire Management Council has been set up under the authority of the Fire Service Act. The Council draws membership from all the principal fire users and managers in the State, as well as the three land management agencies. The Council has the specific responsibility to advise the government, through the Minister, on all matters pertaining to bushfire management. This greatly enhances cooperation and communication between the different groups at the highest level, and provides a forum for joint policy development or review.

The IFA recommends

- (i) *that COAG works to develop bushfire policy which will assist to integrate agencies, and assists State and territory agencies to address constraints on the availability and maximum utilisation of available resources for fuel reduction burning as well as for bushfire suppression; and*

- (ii) *that COAG examine the need for a national system of bushfire training, concentrating on leadership and command.*

4.8 Liability and insurance

An increased insurance burden on ordinary Australians is the inevitable consequence of larger, fiercer bushfires, which in turn is the inevitable outcome of ineffective bushfire management. The Insurance industry does contribute funds to fire fighting in Australia, but in our view could do a lot more to promote and fund fire prevention, preparedness and community education.

The question of liability is a serious and growing one. This and a number of related issues will no doubt be tested in the courts in the coming years arising from the events of summer 2002/3. We are particularly concerned about a reported change in the attitude to Duty of Care in some land management agencies in recent years, with a shift in priorities to protecting conservation values, rather than protecting human values (i.e. life and property). There is also the question of liability relating to approvals by local councils to allow expansion of residential development into bushland in the full knowledge that these people will become vulnerable to bushfire damage. These issues need to be fully teased out, and the consequences made clear.

The issue of “fire-fighter liability” is a serious concern. By this is meant the risk that men or women in fire command positions will be found legally liable in the case of a bushfire damaging private assets. Threat of litigation is becoming a major disincentive for community members to participate in fire suppression activities. The liability issue is further clouded with increasing reliance by some governments on contract fire fighting resources and corporate volunteers.

The role of the Australian media is generally not helpful, in that it tends to dramatise and glamorise suppression, while ignoring or denigrating fire prevention. Over many years, the media has (rightly) raised the status of firefighters to the level of heroes, while off seasonally attacking land management staff engaged in fuel management work.

Finally, the IFA is concerned about situations in some States where police have powers to force people to abandon their houses during a bushfire. Many years of research by CSIRO has indicated that if people are properly informed, have prepared their properties in advance, and stay to defend them, not only will they survive the fire, but so will the house. Forced evacuation of property by police officers with no bushfire experience may lead to increased property damage and increased costs from bushfires.

The IFA recommends that COAG promotes the adoption of legislation (similar to the Victorian legislation) that prevents the forced evacuation of a person from any land or building if the person has a pecuniary interest in the land or building or valuables on the land or building.

4.9 The bushfire database

The IFA draws to the attention of COAG a fundamental problem in reviewing bushfire outcomes in Australia: there is no comprehensive national database for bushfire occurrence, cost and damage. This is despite a recommendation that this be done in 1984 by the Standing Committee on Forestry in the wake of the Ash Wednesday Fires. Statistics of various sorts are kept by different State and Federal agencies, but there is no standard protocol, no consolidated database or custodian. This means that it is impossible to measure progress and the effectiveness of expenditure on bushfire management by assessing a time-series of actual outcomes in terms of fire events. A database of this kind would also make an important contribution to meeting Australia’s obligations for monitoring Greenhouse gas emissions and progress towards achievement of ecologically sustainable forest management under the Montreal protocol.

The IFA recommends that COAG develops and institutes a national database for bushfire statistics; the minimum database should comprise number and size of bushfires by land tenure for each fire season, and the area subject to prescribed burning for fuel reduction, habitat management and forest regeneration purposes.

Note: We are aware of attempts some years ago to establish the Australian Incident Record System (AIRS). This did not prove to be successful, as it was too ambitious, and too demanding on people in the field. Fire statistics must be few and relevant to be collected and to be useful. AIRS should not be resurrected as an outcome of this recommendation.

5. Conclusions

Bushfires are an inevitable feature of the Australian environment. They arise from the inevitable ignition of flammable fuels under hot windy conditions.

In general, our fire management understanding, planning and control systems and technology has evolved to the point in which most bushfires do little damage and are readily enough controlled. On the other hand, we are still faced with the problem of dealing with the intense “killer” fires which occur at the back-end of every drought period and are nearly always associated with long periods of fuel accumulation; these are the main source of damage and loss. It is well to remember that less than 10% of bushfires do more than 90% of the damage.

It is not that we don't know what to do to fix this situation. We have most of the research information, the technology and the experts. Four major ingredients are missing:

1. An agreed policy approach, based on science and experience, which crosses land tenure, administrative jurisdictions, transcends ideology and which is implemented Australia-wide.
2. True accountability at Ministerial level for bushfire outcomes, underpinned by effective arrangements for setting objectives and targets, implementing fire management plans, research, independent audit and public reporting.
3. A commitment to reducing forest fuel levels by prescribed burning wherever it is feasible, and under the direction of skilled professionals, so as to provide firefighters with a chance of controlling intense fires, as part of the holistic system of fire management which also incorporates preparedness, prevention and suppression.
4. A well-educated public, a community which understands bushfire risks to the extent that it is prepared to take and to support effective fire prevention work at both the landscape and the householder levels.

These are the *fundamental changes* to the way bushfire management in Australia is conducted, and we recommend that they become the basis for the Select Committee's report. Many other issues will be raised (and have been raised in this submission), but they are of subsidiary importance.

The role of COAG should be to promote good fire management systems. Such systems will be professionally designed, audited and publicly reported. Specifically, the IFA believes that it is better for the Commonwealth to fund fire management systems that effectively prevent bushfire disasters, than to fund firefighting once a disaster is upon us.

Appendices: IFA Fire Policies

The following two policies are derived from the IFA's former policy on bushfire management in Australia, and are in the form of "final drafts".

1. Managing Fire – the policy of the Institute of Foresters of Australia

The Issue

In most Australian forests and woodlands weather conditions occur every year during which, given sufficient fuel, bushfires can be virtually impossible to contain. Uncontrolled fires can pose a serious threat to human life, property, community assets and forest values and these impacts need to be minimised by effective management. Fire also plays an important role in the maintenance of biodiversity and ecological processes and is an essential tool for silviculture and forest management. Forest managers are required to integrate a broad range of fire-related issues and to implement management programs that address objectives related to ecosystem management, sustainability and community protection.

Background

Management of fire in forests and woodlands is principally based in legislation passed by State and Territory governments. This may include general legislation relating to fires in rural areas, as well as specific provisions in the legislation that governs the management of publicly-owned native forests and plantations. The Commonwealth Environmental Protection and Biodiversity Conservation Act impose requirements in relation to fire management activities. Common law provisions may also impose a duty of care on forest owners and managers with regard to fire.

Planning for fire management requires systematic assessment and analysis of the threat of bushfires to forest and community values. Hazards and risks associated with bushfires are addressed through the development of strategies for prevention, preparedness and suppression of fire. Fire prevention activities include public education and awareness programs, minimising the risk of fire outbreaks from forest operations and recreation activities, enforcement of fire regulations, and thorough investigation of the cause of fire outbreaks.

Preparedness involves the management of fuels, detection of fires, provision of communications systems and development of response plans to be activated in the event of unplanned fires. Collaboration between forest managers and other agencies responsible for fire management in rural areas is important in ensuring that resources are used efficiently and that the response to fire emergencies is effective and well coordinated.

The provision of a well-equipped and trained workforce is also an essential component of fire preparedness. Agencies responsible for the management of forests have a requirement to maintain an effective workforce available for fire management tasks, and to allocate sufficient resources to this task in order to meet their duty of care to the community, volunteer fire-fighters, and their own employees. Safety of personnel must be a paramount consideration in all operations associated with fire suppression or the planned use of fire.

Prescribed burning is the planned application of fire under specified environmental conditions to meet particular management objectives. Prescribed burning is an important tool for forest management and is used for a range of purposes including forest regeneration, site preparation, fuel reduction and habitat management. Scientific studies have demonstrated that the speed and intensity at which a forest fire burns is related to the amount and arrangement of fuel comprised of leaves, twigs, bark and understorey shrubs. In most forests, the amount of fuel increases with the time since last fire, and may continue to accumulate for several decades. Prescribed fire can be used to reduce the amount of accumulated fuel, thereby reducing the intensity and difficulty of suppression of unplanned fires, and minimising likelihood of severe damage to forest values. Prescribed burning can also have an important role in providing heterogeneity of fire regimes at a landscape scale.

Fire management programs should be based on the best available information about fire behaviour, the role of fire regimes in the environment, and the influence of fire on communities and society. This requires a commitment to ongoing research in a range of disciplines, and a commitment to technology transfer to ensure that new information is made available to decision makers and practitioners. Scientifically-based decision support systems are an important tool for integrating a wide range of information and can assist managers to make consistent and transparent decisions about complex issues.

Decision support systems are currently being used for smoke management and to plan the use of prescribed fire for biodiversity conservation.

There is a need for forest managers to engage the community during the development and implementation of fire management programs, particularly where publicly-owned forests and woodlands are involved. Fire-related issues likely to be of interest to the community include environmental protection, risk management, and the relationship between bushfire smoke and human health. Effective communication and consultation with the community leads to greater support for fire management programs, and ensures that knowledge available within the community is made available to forest managers.

Policy

The Institute of Foresters of Australia advocates:

1. That management plans for forest and woodland landscapes should recognise the important ecological role of fire and provide strategies to ensure that fire regimes are compatible with broad land management objectives;
2. That forest managers have a responsibility to minimise adverse impacts on society that may result from uncontrolled forest fires, and should allocate adequate resources to manage fire risk in an effective and safe manner;
3. That there is a need to manage the accumulation of flammable litter and understorey fuels in strategic areas of forest in order to limit the intensity and difficulty of suppression of fires;
4. The use of prescribed fire as an effective tool for managing fuel accumulation, maintaining ecosystem processes and achieving silvicultural outcomes in forests and woodlands;
5. Recognition of the importance of effective communication and consultation between forest managers and other stakeholders in relation to planning and implementing fire management activities;
6. Development of inter-agency agreements to address issues of common interest related to forest fire management including resource sharing, standardisation of training and equipment, and mutual aid during fire emergency situations;
7. The use of scientifically-based decision support systems to inform forest managers in the context of strategic planning, resource allocation and operational issues related to fire;
8. The application of performance indicators that provide meaningful information about the effectiveness of fire management in terms of environmental, social and economic outcomes.

2: The role of fire in Australian forests – the policy of the Institute of Foresters of Australia

The Issue

Bushfires are a characteristic feature of forests and woodlands throughout Australia. At one extreme, extensive areas of grassy forest and woodland in northern Australia burn annually or every few years. In contrast, tall moist forests in southern Australia may experience high intensity fires at irregular intervals of decades or even centuries. Between these extremes there are a wide variety of fire regimes characterised by combinations of frequency, intensity, season, scale and patchiness of burning.

Fire plays an important role in the maintenance of biodiversity and ecological processes and contributes to the distinctive nature of Australian forests and woodlands. At the same time, uncontrolled fires can pose a serious threat to human life, property, community assets and commercial forest values. Inappropriate fire regimes may also threaten ecological values. In most Australian forests, complete fire exclusion is neither feasible nor ecologically desirable. Forest managers must therefore seek to understand the role of fire and to manage it in ways that complement broad objectives for land management.

Background

Fire is one of the most important factors in the ecology of Australian forests and woodlands. Charcoal deposits in lake sediments and pollen evidence indicates that forest fires have occurred periodically since Tertiary times, more than 16 million years before present. Aboriginal people have inhabited much of the continent for more than 40 000 years and over this period have used fire as a management tool for cooking, hunting, maintaining access and for spiritual reasons. The landscapes that European colonists and their descendents have come to recognise as being distinctively Australian have been fashioned by fire over many generations. Lightning causes a substantial number of bushfires, and is likely to have been an important source of ignition in pre-historic times.

Fire regimes are influenced by environmental factors including climate and weather, topography, soils, and the characteristics of the vegetation itself. In many forest landscapes, fire regimes have changed dramatically in the last two centuries as a result of agriculture and urban development, changes in land management practices, legislative restriction of the lighting of fires, and organised fire control.

Occasional extreme events such as prolonged droughts and severe fire weather conditions can greatly increase the scale and intensity of fires beyond what is experienced in an average season. The effects of extreme bushfire events on human society and the environment can be profound.

Fire plays an important role in a number of ecological processes within forests and woodlands. Heat, smoke and ash provide triggers for germination of many plant species, and a number of eucalypts regenerate best on ash seedbeds produced by burning. Fire regimes affect nutrient cycling processes in forests, and fire is instrumental in mobilising some elements into inorganic forms that are available for uptake by plants. Stand development processes including recruitment, mortality, senescence, hollow formation and litter accumulation can be substantially influenced by fire, with resulting effects on structure, density and composition of understorey and overstorey layers. For this reason there is a direct relationship fire regimes, habitat condition and population densities of many fauna species. In some environments, fire regimes play an important role in determining the boundary between different vegetation types including rainforest, eucalypt forest, shrubland and grassland.

Altered fire regimes may be linked to a decline in ecosystem health and vitality, inadequate regeneration, weed invasion and more frequent outbreaks of pests and diseases. Excluding fire from naturally fire-prone forests can lead to conditions quite different from those with which existing ecosystems have developed. Fire exclusion is also likely to result in an increasing risk of large-scale high intensity bushfires.

Fires in forests and woodlands can produce very large quantities of smoke and release significant amounts of greenhouse gases. Heavy concentrations of bushfire smoke can inconvenience the community and cause significant economic loss if the use of airports and major roads is restricted. At a national scale, fire regimes have considerable scope to influence greenhouse gas emissions and carbon balances and need to be managed accordingly. It is likely that these global issues will increase in prominence in the years to come.

Policy

The Institute of Foresters of Australia:

1. Recognises that fire has an important and on-going role in maintaining biodiversity and ecological processes in forests and woodlands;
2. Recognises that the ecological effects of fire vary according to the season, frequency, intensity, scale and patchiness of burning in a landscape;
3. Believes that the decision to deliberately exclude fire from naturally fire-prone forests and woodlands represents one extreme of the possible range of fire regimes, and that this can have consequences for the condition of ecosystems in the longer term;
4. Supports education and information programs to better inform land managers and the community about the role of fire in Australian ecosystems;
5. Recognises that forest fires can have effects that are significant at local, regional and global scales and that communities, agencies and governments should foster cooperative arrangements in relation to understanding and managing forest fires;
6. Advocates the need for ongoing and well-coordinated research into the behaviour, environmental effects and social impacts of bushfires;
7. Supports the collection, analysis and distribution of comprehensive information about fire regimes in forests and woodlands throughout Australia.

Submission authorised by J. Adrian O'Loughlin, Executive Director, Institute of Foresters of Australia
PO Box 2 Yarralumla ACT 2600. Ph: 02 – 6281 3992. Email: ifa@forestry.org.au