



The role of fire in Australian forests and woodlands

Forest Policy Statement No. 3.1

The Issue

Fire is critical to the maintenance of biodiversity and ecological processes and contributes to the distinctive nature of Australian forests and woodlands. At the same time, uncontrolled fires pose a serious threat to human life, property, community assets and forest values including water, wood and biodiversity. Large-scale high intensity fires, often referred to as firestorms, have periodically inflicted major losses on the community since European settlers arrived in Australia. 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 of aboriginal burning. Lightning causes a substantial number of bushfires, and is likely to have been an important source of ignition in pre-historic times. 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 combinations of frequency, intensity, season, scale and patchiness of burning characterise various fire regimes.

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. Fires also result in loss of nutrients from forests and woodlands in the form of particulates in ash and smoke, and volatilisation. 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 often a direct relationship between fire regimes and structural features of the vegetation that determine habitat condition and population densities of many fauna species. In some environments, fire regimes play an important role in determining the ecotone between different vegetation types including rainforest, eucalypt forest, shrubland and grassland.

Excluding fire from naturally fire prone forests and woodlands can result in conditions quite different from those that have historically given rise to these ecosystems. Altered fire regimes may be linked to changes in ecosystem health and vitality, regeneration patterns, weed invasion and occurrence of pests and diseases. Fire exclusion is also very likely to increase the risk of large-scale high intensity bushfires. While such fires are an important trigger for regeneration in some forest and woodlands, they can also have adverse effects including loss of heterogeneity in vegetation structure, temporary increases in stream sedimentation, and persistent reductions in stream flow from forested catchments.

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 (IFA) advocates the need for a better appreciation of the important and complex role that fire plays in the evolution and maintenance of Australian ecosystems, including the collection and analysis of comprehensive scientific information and the effective distribution of information to policy makers, land managers and the community.

The IFA recognises that:

- fire is an agent of ecological change which has an important and on-going role in maintaining biodiversity and ecological processes in Australian forests and woodlands;
- the ecological effects of fire vary according to the season, frequency, intensity, scale and patchiness of burning in a landscape;
- forest fires can have effects that are significant at local, regional and global scales

The IFA considers that:

- State, Territory and the Australian governments have a responsibility to provide adequate resources for and coordinate research into the behaviour, environmental effects and social impacts of bushfires;
- A decision to deliberately exclude fire from naturally fire-prone forests and woodlands as an extreme fire regime that can have adverse consequences for ecosystem condition in the longer term;
- communities, agencies and governments should foster cooperative arrangements in relation to understanding and managing the impacts and use of fire in Australian ecosystems;

Further information

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<http://www.bushfirecrc.com>

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