

## Guest editorial

### Can forestry manage bushfires in the future?

At ANZIF 2007 in Coffs Harbour, Professor Kanowski suggested that it was necessary to carry out a landscape-scale study to validate the effectiveness of prescribed burning. Unfortunately, our senior academic was serious and this highlights a perennial problem of the Institute — the opinions of its members have been split, or even diametrically opposed, on the question of prescribed burning. It also suggests that while forestry has been at the vanguard of bushfire research and management for more than 100 years, that era is coming to a close.

Writing in the first issue of *The Australian Forestry Journal* in 1918, district forester H.J. Lyne described the practical problems of suppressing bushfires in the eucalypt forest: ‘... the wind carries burning bark from tree top to tree top over great distances’, and ‘... fires that could not have been checked by firebreaks of 5 to 6 chains [100–120 m] or more’. His suggestion was ‘to appoint fire overseers from practical bushmen to burn the undergrowth when the conditions were suitable.’

Those foresters who have been involved directly on the problem of suppressing bushfire have no doubt that where there is less fuel the fire is less intense and it is safer and easier to put out. The academics, on the other hand, are distressed by the lack of statistics to validate the efficacy of prescribed burning. They may not argue for statistical tests on whether parachutes might save lives or not (to my knowledge no controlled test on this proposal has been carried out) but they happily reiterate the need to have statistical evidence about the efficacy of prescribed burning. To the practitioner it is obvious.

Perhaps there is a clue to this conundrum in the words of H.J. Lyne. Despite the excellent work of A.G. McArthur, G.B. Peet and R.J. Sneeuwjagt to produce practical prescribed burning guides, the application of prescribed burning still requires the feeling and sense of the practical bushmen who, through their intimate association with the forest, can identify those factors that are not covered in the burning guides. High-quality burning requires a lot of practice in interpreting and interpolating the guides, and this is mostly done by practical foresters — without higher degrees — and their technical staff. Fire management has never rated much in academia outside the fantasies of computer simulation.

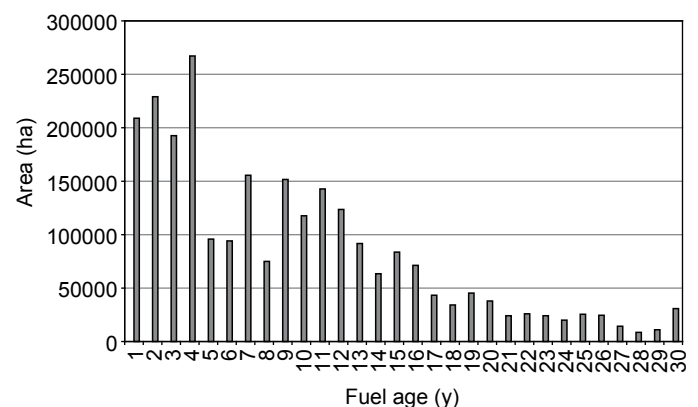
The problem with any landscape-scale trial of prescribed burning is that, to be really effective, it has to be applied right across the landscape. It has to be applied on such a scale that, as with parachute trials, it is impossible to have an adequate control. We already do have a landscape-scale trial — albeit without a parallel control — in the south-western forests of Western Australia. This involves burning 200 000 ha every year and ultimately results in fuel of various ages as illustrated in Figure 1. A program of this magnitude and frequency is necessary to reduce fuels over sufficient areas to stop the run of major fires under extreme

weather conditions and to allow firefighters to suppress a high proportion of fires before they develop to their full potential.

There has not been a major fire in the south-west since the Dwellingup fire of 1961. There have been numerous examples where the fuel reduction program has enabled the forest management agency, now the Department Environment and Conservation (DEC), to manage major fire events with relatively little damage. The most spectacular instances were the fires associated with cyclone Alby in 1968 and more recently the Karragullen–Mundaring fire that burnt from 15 to 25 January 2005. You have not heard of it? Well, you don’t make the news if you put fires out while they are small.

The latter fire commenced as a series of deliberate ignitions, seemingly set to hinder detection and initial attack. The spread of the head fire was stopped in two- and three-year-old fuels just west of Canning Road. I estimated that had fuel reduction not been carried out and fuels had accumulated for 20 years or more, this fire would have burnt over the Darling escarpment and into the Perth suburbs of Roleystone and Gosnells in less than 24 hours after ignition. The weather conditions were such that the fire could have caused widespread structural damage to homes and other buildings in the peri-urban development along the Darling escarpment.

In the eastern states we have had the disasters of 2003 and 2007. There are, of course, differences between the east and west. In Western Australia the topography is relatively flat and the weather conditions in spring are benign, making prescribed burning in jarrah forest relatively easy. But there is no practical difference in the structure of the fuels in the forest; the problem of prescribed burning in the heavy fuels of the karri forest was



**Figure 1.** Area of forest with fuel in annual age classes in forest managed by the Western Australian Department of Environment and Conservation in the south-west land division at July 2006

solved by sound empirical research, followed up by continual training and practice.

In a strict statistical sense, the west cannot be a basis on which to assess the performance of fire management in the east, but the extensive fires in Victoria, New South Wales and the Australian Capital Territory are the result of a change in management, not a change in climate. The term 'megafire' has been coined to woo the press and assuage the politicians and support their apparent belief that these events are an act of God and not the result of the evisceration of the land management agencies, as pointed out by Roger Underwood in a previous editorial<sup>1</sup>.

The forestry profession has always had a good appreciation of landscape scale and the management necessary to apply fire, but I believe that even foresters not intimately involved in the practice of prescribed burning have little appreciation of what is involved in applying fire at that scale. Few people recognise the effort required to burn 200 000 ha every year and produce the distribution of fuel of various ages, illustrated in Figure 1, which is necessary to effectively reduce the impact of wildfire.

Few have an appreciation of the rolling planning process used by the DEC which commences seven years before each burn is carried out, let alone of the prescriptions and cross-checks that tailor the fire in terms of intensity, fuel consumption and fraction of area burnt. These processes are designed not only to reduce the fire hazard, but may also regenerate forest species, manage food and habitat for fauna, protect rare species and cater for the needs of conservation, production forestry, apiculture, wildflower harvesting and a plethora of other forest users and recreationists. Furthermore, the continuing practical training and assessment to ensure that a stream of people expert in burning will be available in the future means that fire management in the DEC provides a benchmark for the rest of the world.

For those unhappy about the science behind prescribed burning, CSIRO and the DEC have just released the results of Project Vesta, a ten-year study of fire behaviour in fuels of different ages — *Fire in the Dry Eucalypt Forest: Fuel Structure, Fuel Dynamics and Fire Behaviour*<sup>2</sup>. The report describes the effect of fuel structure on fire behaviour, and shows that the tempering of fire behaviour following prescribed burning can persist for 15 years. The report also presents new functional relationships between fuel, wind speed and fire spread, and gives new insights into the structure of wind in the forest, the production of firebrands and the spotting process. It should be prescribed reading for believer and sceptic alike.

In some respects this major study is only quantifying what the field forester, the bushman and the aborigines before them have known from practical observation: if you reduce the quantity and amount of fuel you will reduce the rate of spread and intensity of a fire and make it easier to control. And now that the role of forestry agencies as a manager of native forests has been greatly reduced, and forestry research has been decimated in the states



**Figure 2.** A strategic break prepared to contain a back-burn, Swampy Creek, north of Bairnsdale, Victoria (Photo: Greg McCarthy, Bushfire CRC, December 2006)

and CSIRO, it is difficult to see if there any organisation other than DEC capable of using this research and extending it into practice.

Rather we appear to be going backwards. The announcement by the government of Victoria of a decision to build more than 600 km of wide strategic firebreaks<sup>3</sup> across the forest estate was a kneejerk reaction by politicians trying to look good in the face of a disaster. The proposal ignores the advice of H.J. Lyne in 1918 and every practical fire control forester since. The Department of Sustainability and Environment concedes that firebreaks will not stop wildfires under most weather conditions<sup>4</sup> but they are apparently intended to provide a safe area for back-burning (Fig. 2). However, they are unlikely to be in the right location to be of much use. A wide strategic firebreak was built along the top of the Brindabella range after 1939 to stop fires coming into the ACT from the west. It did not form a significant part of the attempted control lines during the 2003 Canberra fires and was easily breached by fires burning in moderate weather.

Unhappily I conclude that Australian forestry has abandoned fire management. This should of course be the responsibility of the conservation agencies — who now manage a substantial proportion of our public lands — as it is in WA. If the trend in Victoria extends elsewhere and fire management is placed in the hands of the politicians and their emergency services organisations that focus on suppression by back-burning from strategic firebreaks, we can expect that large areas will be burnt severely in summer, perpetuating the myth of megafires.

Rather than set up the organisation and training for an effective prescribed burning program, it is far easier, I guess, to attribute the bushfires to God and climate change.

**Phil Cheney**

28 Dalabon Cres, Waramanga, ACT 2611

<sup>1</sup> *Australian Forestry* 70, 1–2.

<sup>2</sup> Gould, J.S., McCaw, W.L., Cheney, N.P., Ellis, P.F., Knight, I.K. and Sullivan, A.L. (2007) *Fire in the Dry Eucalypt Forest: Fuel Structure, Fuel Dynamics and Fire Behaviour*. CSIRO, Canberra ACT, and Department of Environment and Conservation, Perth WA, 218 pp.

<sup>3</sup> *The Weekend Australian* 6–7 January 2007

<sup>4</sup> Department of Sustainability and Environment – web page.