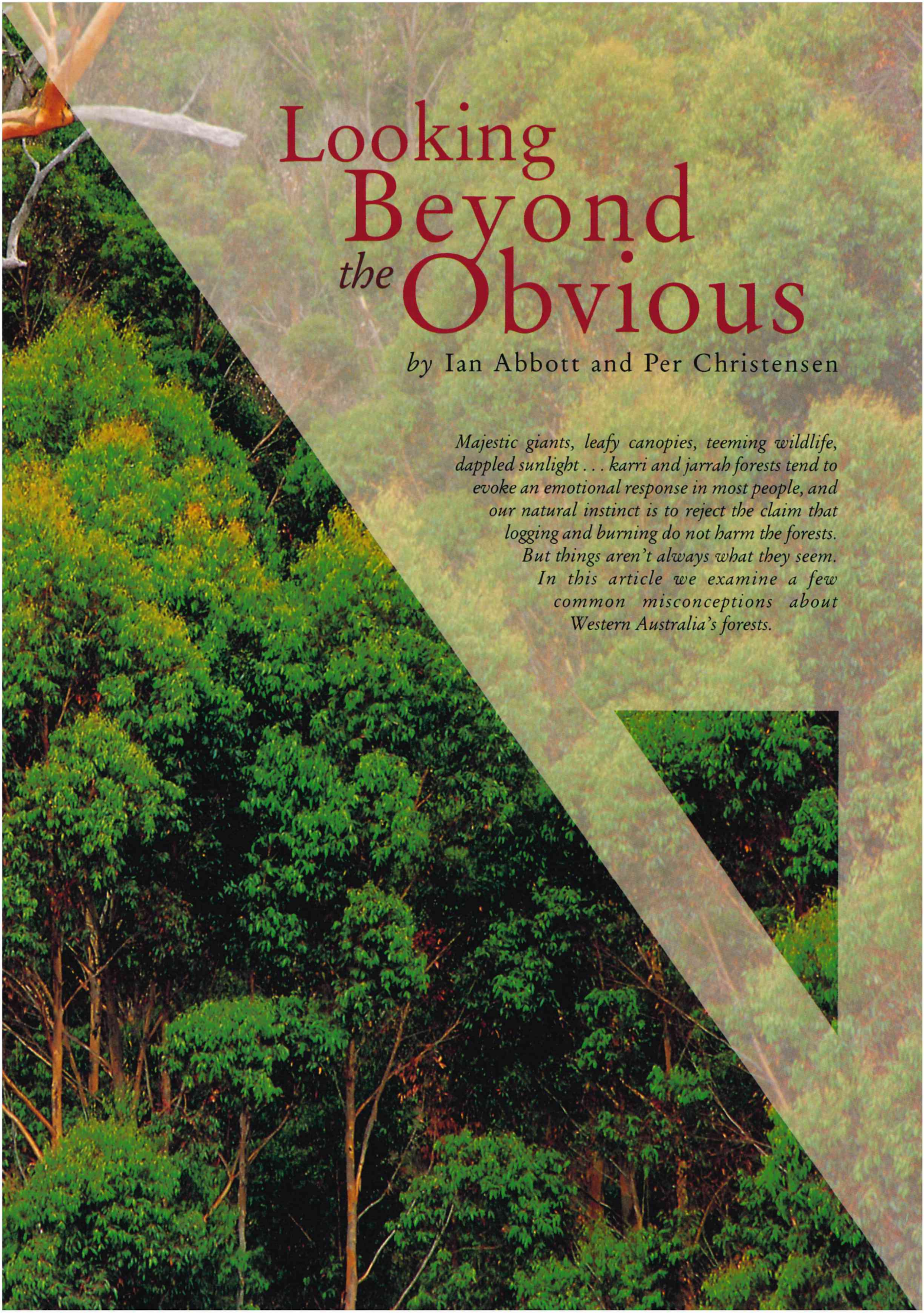


Looking Beyond the Obvious

by Ian Abbott and Per Christensen

Majestic giants, leafy canopies, teeming wildlife, dappled sunlight . . . karri and jarrah forests tend to evoke an emotional response in most people, and our natural instinct is to reject the claim that logging and burning do not harm the forests. But things aren't always what they seem. In this article we examine a few common misconceptions about Western Australia's forests.

A few centuries ago, sailors refused to venture too far west or south, for fear of their ships falling off the edge of the Earth. After all, anyone could see for themselves that the Earth was flat. It took the brave voyage of Christopher Columbus to demonstrate the fallacy of what was apparently obvious to everyone.

Most of us now scoff at the 'ignorance' of our forebears—but are we any better? Humans rely heavily on visual clues; seeing, after all, is believing. And in many ways, we are at a greater disadvantage than our ancestors; they, at least, lived a rural lifestyle and were in touch with nature. People today have become urbanised; they gain information about the natural world second-hand and in simplified form through the news media.

The current debate about what is the most desirable human use of native forests is a good example of this. How many of those claiming that Western Australia's forests are doomed have visited the forests and taken an objective look at them? How many have taken the time to look beyond media statements to check the facts for themselves?

Many critics of logging and burning in the native forests of Western Australia look no further than the obvious immediate aftermath of timber removal or fire: apparently incinerated trees and devastated forests. However, a frequent outcome of scientific study is that what seems to be the commonsense point of view is wrong. In this article, we look beyond the 'obvious' and demonstrate that things aren't always what they seem.

DO WE KNOW ENOUGH?

Some people believe that WA's forests are being logged and burned without adequate knowledge of the forests themselves, the environmental consequences of logging and burning, and the biological processes and composition of forest communities. This is not the case.

More than 50 years of study of jarrah and karri trees and forest ecosystems has resulted in hundreds of published scientific papers. For example, in 1986, there were more than 180 papers on karri forests alone. Comprehensive reviews of knowledge have also been produced for jarrah (1986), the northern jarrah forest (1989), the karri forest (1992) and karri (1995). These are good places to start for anyone wishing to find out what is known about a particular aspect of forest ecology.

Recently, Mike Lyons and Neil Gibson, of the Department of Conservation and Land Management's (CALM) Science and Information Division, put together a bibliography of papers dealing with the biology and natural history of Western Australia. A 1994 paper by these writers (published in *CALMScience* Supplement 1) shows that there are more than four times as many studies for the South West Forest Region as for any other region of WA. Of the 2 333 studies listed, approximately 15 per cent relate to the jarrah or karri forest in State forest, an area of less than one per cent of the State.

Forest research has also included environmental impact studies—investigations of the effect of human disturbance (logging, thinning, fire, dieback, damming of rivers, mining) on the ecology of species or communities. Although forests in Western Australia, Victoria and New South Wales have been subject to similar numbers of impact studies (51, 59 and 54, respectively), Victoria has nearly twice, and New South Wales six times, the forested area of Western Australia. In relation to their area, our forests in WA have had more environmental impact studies than those of any other State. This information has been taken from Report No. 9 (1993) of the Resource Assessment Commission.

Biological surveys in State forest have been intensive. For example, in the 10-year period between 1972 and 1982, surveys of the southern forests included 75 771 trap nights (a measure of the effort spent in trapping animals—10 trap nights may equal 10 traps set for one night or one trap set for 10 nights), 1 340 hours of organised searching for animals and signs

Previous page
Karri tree with old growth characteristics (hollows in its trunk and dead hollow branches) surrounded by regenerating karri.
Photo – Len Stewart/Lochman Transparencies

Below left: 100-year-old regrowth karri at Boranup, in the Leeuwin-Naturaliste National Park.
Photo – Graeme Liddelow

Below: A recently clearfelled and burnt coupe showing extensive ashbeds and retained seed trees.
Photo – Dennis Sarson/Lochman Transparencies

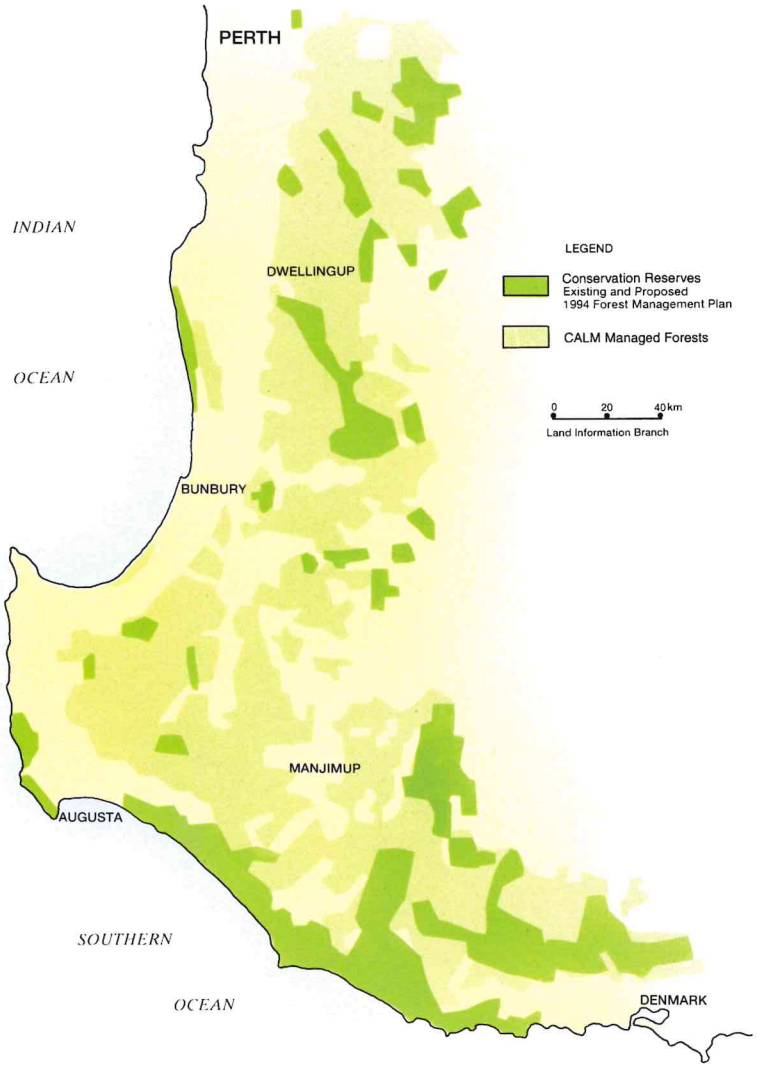
of animals, 2 047 hours of spotlight transects (a measure of the effort spent in searching for nocturnal animals at night, with spotlights), and 795 hours of bird surveys. Not surprisingly, the knowledge base for forest-dwelling plant and vertebrate species is broad. There is also a sound understanding of vegetation types in the northern and southern forests, as well as in the karri forest.

This regional or strategic approach to biological surveying is far more effective than section-by-section surveys, which produce a poor return for the effort expended.

ARE OLD GROWTH FORESTS SACRED?

The term 'old growth forest' inspires a certain awe. In recent years, it has been marketed to conjure up an image of untouched, primeval stands; a place where gnarled and stately trees festooned with lichen and vines reach for the sky through a tangled undergrowth of strange and unknown species. A consequence of this fairytale image has been to hinder rational debate on the use and reservation of old growth forest.

The term 'old growth' may be defined in several ways. For example, 'forests that are both negligibly disturbed and ecologically mature and have high conservation and intangible value' (Resource Assessment Commission, 1992) or 'forest that is ecologically mature and has been subjected to negligible unnatural disturbance such as logging, roading and clearing. The definition focuses on forest in which the upper stratum or overstorey is in the late mature to over mature growth phases' (*National Forest Policy Statement*, 1992). Old growth karri and jarrah forests do not, in themselves, have any special biological significance. The species living in them and the processes that take place there may be present in a selectively logged forest, as well as in forests that have regenerated following clearfelling or natural disturbance. The critical factor, from a biological point of view, is whether or not trees with old growth characteristics are present within, or near, those areas. Primarily, it is the things that large, old trees provide, such as hollows, that make the difference. The understorey and litter, with their associated microclimate, the biological processes and the animals all may be found in disturbed forest, providing the disturbance has not been very recent.



Map illustrating the comprehensive and representative network of reserves throughout the South West forests.

Therefore, species will not become extinct as a result of areas of old growth jarrah and karri forest being reduced, as long as sufficient trees with old growth characteristics are maintained in the forest. Disturbance does not necessarily lessen or detract from the biological conservation values of a forest; any disturbance will favour or disadvantage different species, provided that the disturbance does not result in permanent changes to communities and processes that are part of that forest. With respect to high conservation value areas in forests, we know from the results of biological surveys that the areas of highest conservation value, from the biological point of view, are not the karri and jarrah forests per se. The areas of highest plant and animal diversity, and where also many rare or threatened species exist, are the non-forest communities, which are an integral part of the forest ecosystem. Thus, the vegetation along creeks and rivers, swamps and their surrounds, heath communities, treeless flats and their surrounds, granite outcrops and woodland areas on the edge of the forest are far and away the richest areas biologically—a prime reason why non-forest vegetation types are such an important component of the forest reserve system.

Nevertheless, there are extensive areas of forest of both jarrah and karri that are also in reserves. In particular, considerable areas of ecologically mature forest with negligible to low levels of disturbance have been set aside for their 'intangible' values. These are forests where people may experience the feel of undisturbed nature and, especially in

Areas of old growth forest have been set aside for their intangible values. Photo – Bill Bachman

ECOLOGICAL AND EVOLUTIONARY PRINCIPLES

The following are some of the biological principles that the Department of Conservation and Land Management (CALM) recognises in its management of forests:

- Species vary in their tolerance of variations in climate, soil and topography, and other environmental conditions, and are not distributed haphazardly over the landscape.
- Environmental heterogeneity increases the number of species living in the same locality through expanding the supply of resources, providing more transitional zones, and creating refuges that enable prey to persist in the presence of their native predators.
- A small number of species dominate the rest numerically—most species in ecosystems are naturally rare because their population size is limited by shortage of resources (food, breeding sites and shelter), by disease, by predation and other factors.
- The chemical constituents of organisms are used again and again through recycling.
- Species introduced to Australia have profound ecological impacts on elements of the native plant and animal life, because natural controls present in their place of origin are absent from Australia.
- Following disturbance, communities change progressively in species composition (succession), eventually resembling closely the pre-disturbance state unless another disturbance takes place.
- Most organisms die young, through being eaten by another organism or being weakened by starvation or stress.
- There is a doomed surplus of individuals at the end of the breeding season, with not enough suitable habitat available.
- Dispersal is a continual and obligatory process for most mobile species, making good any losses of local populations (other factors being unchanged). Sessile organisms tend to disperse their progeny on site, mostly onto the soil surface.

the more remote reserves in the southern forests, a wilderness feeling.

Within conservation reserves, there are 135 000 hectares of unlogged (old growth) jarrah forest (representing 35 per cent of jarrah forest in reserves) and 40 000 hectares of unlogged (old growth) karri forest (representing 75 per cent of karri forest in reserves). In addition, a further 28 000 hectares of unlogged jarrah and 13 000 hectares of unlogged karri are in areas excluded from logging, such as in stream and road reserves. The biological value of these unlogged forests is that they add to the total diversity of the forest. Their intangible values also fulfil the aesthetic, as well as deeper needs of humans for undisturbed places.

RESERVING JUDGMENT

The commonly held view that insufficient areas of forest have been reserved cannot be justified on biological grounds. A comprehensive and representative system of reserves has been established and added to over a long period of time, based on knowledge acquired over several decades about vegetation, flora and vertebrate fauna.

In the northern jarrah forest, the only vegetation complexes that are not adequately reserved are those now occurring only outside State forest. These areas—along rivers and in forest and woodland to the east—were targeted for farming in the early days of settlement. Similarly, several vegetation complexes near Collie are poorly represented because of past clearing for coal mining operations.

In the southern forests, where there has been less clearing for agriculture, it has been possible to reserve nearly 159 000 hectares of unlogged forest in national parks, nature reserves, conservation parks and other reserves. Much of the 61 000 hectares of forest along roads, rivers and streams is also unlogged. This is an integral part of the reserve system, and will remain so.

In total, some 512 000 hectares of the jarrah forest (representing 33 per cent) and 81 000 hectares of karri forest (representing 46 per cent) are protected in the reserve system (see map).

HEALTHY REGENERATION

It is sometimes claimed that timber harvesting in State forest has resulted in ecological decline. In fact, Western Australia's forests are in sound ecological condition, and the reason for this is that professional foresters ensure that every hectare of State forest that has been logged is regenerated. Vegetation cover returns to pre-logging levels within five to ten years.

Clearing of native vegetation outside State forest is permanent, as the land is used for other purposes such as agriculture, horticulture and urban and industrial development. Currently, an average of 14 500 hectares of jarrah forest and 1 500 hectares of karri forest are logged each year; some one per cent and two per cent, respectively, of each forest type. This means that most of the forest remains undisturbed for most of the time. The scale of disturbance—between one and ten hectares in jarrah forest and averaging 50 hectares in karri forest—is also very small.

Logging, be it clearfelling (the removal of all timber) in small, dispersed areas (coupes), or selection felling (the removal of selected trees), is a forest management practice that has resulted

in healthy forest regeneration and environmental heterogeneity. This practice has several benefits.

First, clearfelling creates areas of forest of different ages in close proximity to each other, thus enabling fauna species that live in young, regrowth forest to commingle with those species living in older growth forest.

Second, logging operations disturb some of the soil surface and provide a tilth favourable for germinating the seeds of many plant species. This helps increase local diversity.

Third, the germination of some hard-seeded plant species is favoured by the higher soil temperatures of dry soil caused by prescribed burning following clearfelling.

Fourth, the provision for undisturbed areas, by means of coupe dispersion, assists with recolonisation, by both animals and plants, of nearby clearfelled coupes. Over time, there is a fairly orderly succession of species returning to coupes as the forest regenerates and the trees grow.

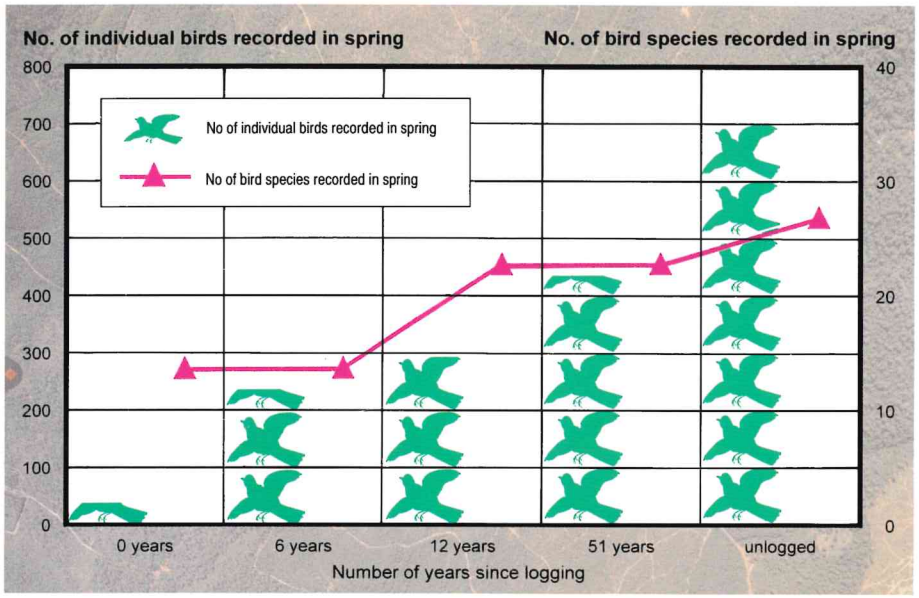
This disturbance process creates an opportunity for young animals, and seeds, from the surrounding forest to establish in a piece of unoccupied habitat. In the natural order of things, most of these young animals would starve and die in the absence of vacant habitat. For example, only 15 per cent of young woylies survive for more than a few months after leaving their mother. Woylies produce three young each year, so there is always a huge surplus.

This process also occurs in burnt areas, young animals from unburnt patches and surrounding areas invade the regenerating burnt areas to replace those lost in the fire. Dispersion of cutting coupes across a wide area and burning in different seasons, both spring and autumn, creates diversity and helps this recolonising process.

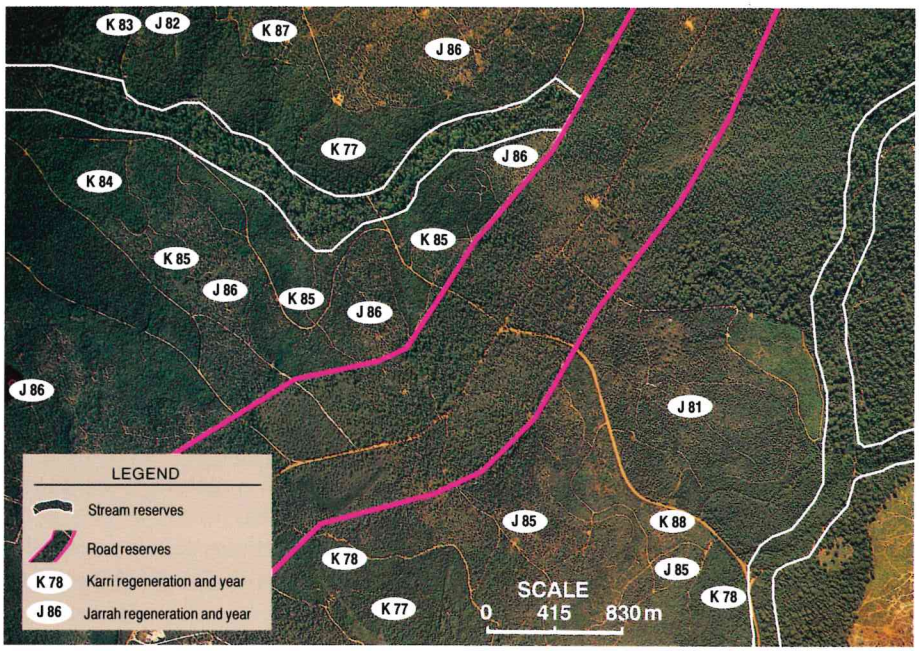
FACT OR OPINION?

Opponents of logging and burning in the forests of Western Australia are entitled to their points of view. But their opinions are, however, not supported by the known facts. As time passes, we will gain more knowledge and greater understanding, but this will not change the basic fact that with good management, forests can be used for timber production purposes, while retaining their conservation values. It is the nature of scientific inquiry that absolute truth or perfect knowledge is never attained—the process is one of closer and closer approximation to the truth through the elimination of error.

The last 25 years have seen large gains in knowledge of the ecology of our forests. These gains, in turn, have resulted in a stronger scientific basis for delineating the conservation estate, better management of timber harvesting and protective burning, and keener understanding of the biology of the two species pivotal to the entire forest—jarrah and karri.



Top: Graph illustrating the return of birds to karri forest following clearfelling and regeneration.
Data – A.Tingay & S.R.Tingay, *Bird Communities in the Karri Forest of Western Australia.*



Above: Spatial arrangement of logged coupes of jarrah and karri near Pemberton, in relation to road, river and stream reserves of mature forest.
Photo – Dept of Land Administration (Lic 478/95)

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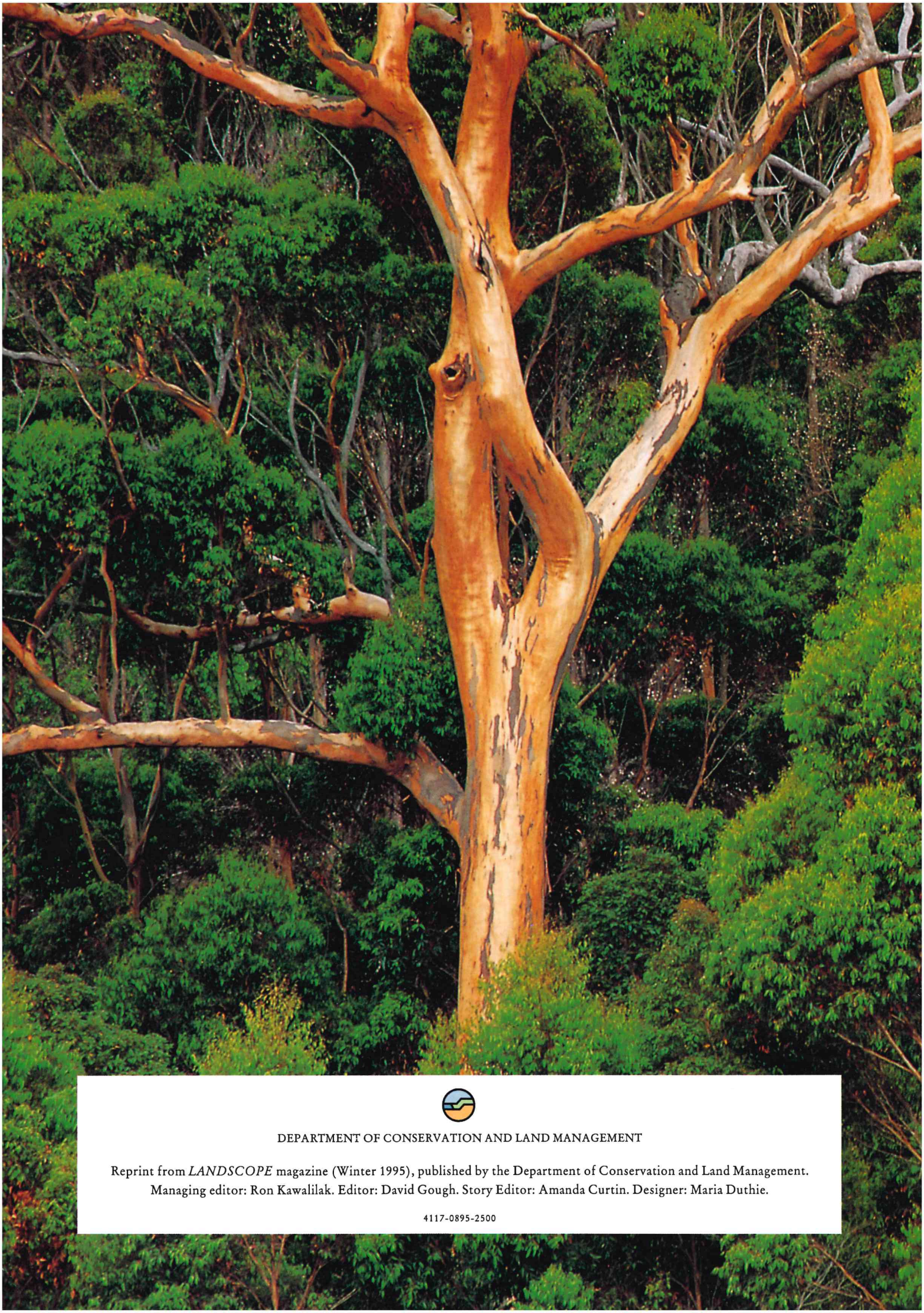
The research data referred to are available from the library at CALM's Como Research Centre on (09) 334 0314.



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