



Fire

Finding the best prescription

Fire. It's as much a part of the Australian environment as the kangaroo and the eucalypt. But the way Australian forests burn has changed in the past 200 years or so. What impact do such changes have on ecological and other forest values?

Finding an answer to this question requires well laid-out field studies which must be monitored intensively for a long time. According to Dr Partap Khanna at CSIRO Forestry and Forestry Products, fire induces significant short-term and long-term cumulative effects in forests.

'For example, there may be a short-term increase in the availability of some nutrients, but too-frequent burning may deplete nutrient capital and disrupt nutrient cycling in the long term,' he says. 'Only a long-term study can test such a hypothesis.'

Prescribed burning is common practice in many native forests, designed to minimise the risk of wildfire. In 1977, Khanna's colleague Dr John Raison established a long-term study in sub-alpine eucalypt forest of the Brindabella Mountains. His aim was to assess the effects of repeated prescribed burning on forest nutrition and growth by examining

fuel dynamics, nutrient losses in smoke, nutrient cycling and vegetation dynamics under a range of fire frequencies. Other colleagues, notably Dr Heather Keith, have contributed to a comprehensive understanding of the disturbance ecology at the site.

The study has yielded information of critical importance for fire management. For example, fuel-loads capable of supporting a wildfire accumulated well inside the six-year interval employed in many fuel reduction burning regimes.

'However, 8–10 years are required before the nitrogen lost in a single fire is replaced by natural processes,' Khanna says. This creates a dilemma for forest managers: burn too soon and you risk loss of soil nutrition, burn too late and you risk a wildfire. This insight – along with others gained by Jamie Hoare on understorey and tree dynamics – suggests that fire management needs to be much more subtle and strategic than was previously supposed if forest managers are to achieve acceptable trade-offs between fire protection and the maintenance of ecological values.

The study has also provided many research opportunities relating to forest responses to climate, the carbon balance and greenhouse effects, and the modelling of forest productivity.

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Alastair Sarre

Happy birthday

WELCOME to the 100th issue of *Ecos*, the magazine born in August 1974 with the message that 'science must interact with the situations and problems of the world'.

These words were penned for the magazine's first edition by former CSIRO chairman JR Price, who recognised the importance of providing environmental decision makers with ready access to scientific knowledge. 'I believe CSIRO should let them have the facts it has to offer, in a lucid and balanced way,' he said. '*Ecos* plans to do this.'

Price also identified the need for more research on 'environmental matters'. Twenty-five years on, *Ecos* continues to present the facts, and the words of JR Price ring just as true. Articles in this issue show that the need for environmental research has not abated. In fact, many of the problems covered in the 1970s are still being studied today.

This issue's cover story is a classic example. The problem of heavy metal contamination in the Derwent estuary was covered in *Ecos* 1, and again by Roger Beckmann in *Ecos* 50. Our follow-up shows that despite improvements in environmental practices, the Derwent estuary remains highly degraded, and the knowledge needed to repair it simply doesn't exist.

To help mark the 25 years of *Ecos*, this issue features several stories that highlight the importance of long-term research. It also presents the views of five senior scientists who recall major advances in environmental science, and identify the challenges ahead.

Celebrating with *Ecos* this year is CSIRO Wildlife and Ecology which has been in operation for 50 years. Our story by Alastair Sarre reveals the division is experiencing a period of upheaval in response to changes in the way its research is funded. This challenge is shared by many of Australia's research institutions.

We look forward to examining many more issues of importance to the Australian environment in future editions of *Ecos*. In the meantime, thank you to all the readers who have supported the first 100, and to the scientists, writers and others who have helped to put the magazines together. And thank you to former *Ecos* editor Robert Lehane, whose involvement with the magazine spanned some 17 years.

Bryony Bennett

How many moths?

IN *Ecos* 99, the story Shedding light on Lepidoptera said there were an estimated 40 000 species of moths and butterflies in the world. The correct number is 400 000. We apologise to the insects and entomologists.