

The yellow-bellied glider was not a frequent find in the areas studied.



South-eastern forests: felling and fauna

One of the main elements of the debate over the future of the south-eastern forests, around the towns of Eden and Bombala in southern New South Wales, is the effect of logging on the native wildlife.

Dr Wayne Braithwaite of the CSIRO Division of Wildlife and Ecology in Canberra has been conducting research on the fauna of these and other forests for many years. The animals most directly affected by logging are those that live in trees — the arboreal marsupials, such as gliders, possums, and koalas. His surveys have shown that these mammals have a very patchy distribution.

Although it may all look similar at a casual glance, one bit of a eucalypt forest is definitely not the same as another. The animals know this and prefer particular areas. In the early 1980s, using information gathered by 36 felling crews, Dr Braithwaite drew up a tally of animals and where they occurred (see *Ecos* 43). Greater gliders were the animals most frequently found by the loggers, followed closely by feathertail gliders and then sugar gliders. The yellow-bellied glider was not common, and the pygmy possum was very rare. The scientists recorded no sightings of koalas; the reason for this will become apparent later.

The mountain brushtail possum also occurs in the area, but logging crews never saw it. Dr Braithwaite speculates that either it is more sensitive to disturbance than other animals and leaves an area ahead of logging, or it spends the day in burrows or logs on the ground and so escapes detection upon examination of felled trees.

Correlating the numbers of animals reported with the area in which they were found showed how uneven is their distribution. Of the animals counted, 63% occurred in just 9% of the total sample area. In 52% of the area cleared (2890 ha), the crews found no animals at all.

Dr John Turner and his colleagues at the Forestry Commission of New South Wales analysed the nutrients in the leaves and soon showed what lay behind the patchy distribution. The animals preferred sites in areas where the leaves were rich in phosphorus, nitrogen, and, most importantly, potassium. Leaf nutrient levels provide a good measure of forest fertility.

Some areas of the forest are far more

fertile than others — simply because of the type of rock beneath the soil. Devonian intrusive rocks (a type of granite) form a nutrient-rich soil and, hence, the plants growing in it are richer too. Leaf-eating animals, birds, and even ground mammals are more successful in these spots and congregate there.

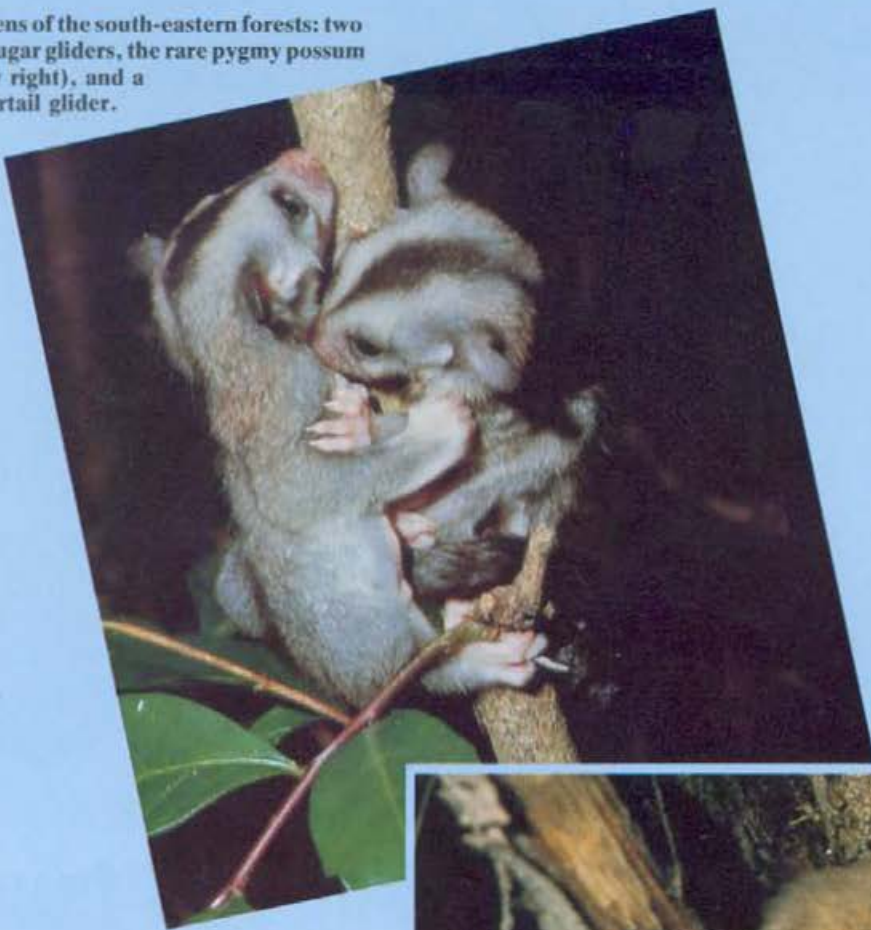
A few, however, specialise in using the 'poorer' forest areas. Examples are the glossy black cockatoo that feeds exclusively on she-oak cones, and certain species of honeyeaters that like banksia heathlands.

Types of forest

Of course, a natural forest seldom consists of just one species of tree. About 90 species of eucalypts grow in the south-eastern forests, grouped into about 70 communities and 30 forest vegetation types. Dr Braithwaite has correlated his data on animal numbers with the Forestry Commission's descriptions of forest vegetation types, knowing that soil fertility also affects the occurrence of the various tree species.

He found that high concentrations of many of the tree-dwelling marsupials occurred most often where 'peppermints' (eucalypts of the species *Eucalyptus radiata*, *E. dives*, and *E. elata*) grew. Other important vegetation types were ribbon gum—maiden's gum — the most important habitat for the greater and feathertail

Denizens of the south-eastern forests: two baby sugar gliders, the rare pygmy possum (below right), and a feathertail glider.



Their favourite trees

possums and gliders per 100 ha



Tree types vary widely in their attractiveness to the arboreal mammals.

Correlating rock, soil, temperature, and rainfall data with counts of animals, Dr Braithwaite and his colleagues devised this map showing the likely distribution of arboreal mammals if all areas were forested. Many of the potentially richest areas have been cleared for farming.

gliders — and brown barrel. The stringybark and ash forest vegetation types were notably poor habitats, and these comprise a large proportion of the logging area around Eden.

However, in the southern tablelands around Bombala the situation is a little different, with a greater proportion of high-fertility areas present. According to predictions by Dr Braithwaite and his Divisional colleagues Dr Chris Margules and Dr Mike Austin, parts of the National Estate regions, such as Tantawangalo and Coolangubra, are likely to be fauna-rich.

Correlation of animal abundance with the forest vegetation type, and with soil and rock types and leaf nutrients, means that foresters should be able to make a reasonable prediction of the faunal 'richness' of an area before it is designated for logging.

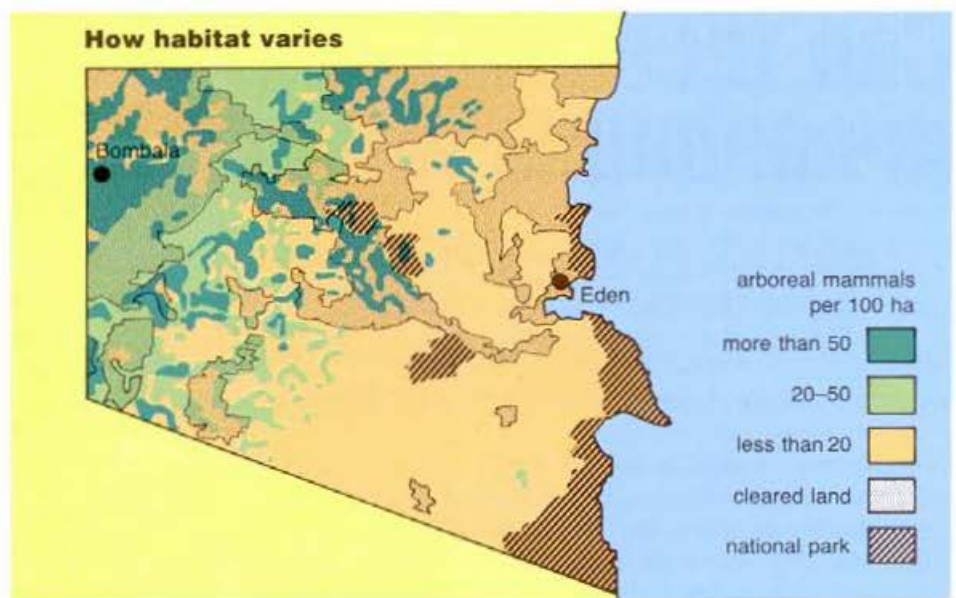
Mr Doug Binns and Mr Rod Kavanagh, from the New South Wales Forestry Commission, have confirmed the accuracy of Dr Braithwaite's correlations between animals and tree types by counting animals directly at night in various habitats. As a result, the Commission can identify and set aside fauna-rich areas — this has been done, for example, in the Waratah Creek region of the Coolangubra State Forest.

Problem

The fact that areas of faunal richness and high fertility go together is a problem for conservation because of the attractions of the fertile zones for farming. The areas of highest forest fertility, on the whole, were 'taken' long ago and cleared.

This explains the dearth of koalas. Dr Braithwaite suspects that most of the forests around Eden never did support large numbers of the animals, simply because koalas prefer nutrient-rich leaves. He believes they probably did occur in the better-quality forest that was taken into private ownership and cleared long ago for grazing.

Even now, many of the nutrient-rich areas that still remain forested are in private ownership. Australia-wide, 21% of the native forest is privately owned, but in New South Wales the figure is 34%. Dr Braithwaite identifies this as a major problem for conservation, because private land-owners clear the native forest to grow pastures, whereas in State forests logging



occurs in small patches to ensure that re-seeding can occur. Also, strips of uncut, mature forest are left along creeks, so providing wildlife corridors.

The woodchip company Harris-Daishowa gets 10-15% of its timber from private landholdings. Of this timber, about 82% comes from forest vegetation types of high fertility and faunal richness. (About 30-40% of the tonnage taken from State forests comes from such areas.) Furthermore, once private forest land is cleared and the timber sold, the owner is likely to use the area for grazing rather than for any forest regeneration. Harris-Daishowa has estimated that all the available timber on private land in the Eden area will be consumed by the year 2021.

Moreover, the sale of timber and clearing of private landholdings affects more than just the fauna. That land, being the most fertile, produces the most timber per hectare, and has the potential to continue to do so. Its clearing for pasture occurs at the expense of future timber production — contrary to a timber company's interests in the long term.

Of course, any logging causes disturbance, and the forest that grows back — while of the same species composition — does not necessarily look the same as the one it replaces. To what extent does this regrowth forest qualify as suitable wildlife habitat? Dr Braithwaite has evidence that the stimulation of growth that follows logging in patches or a fire may actually benefit some animal species — mainly ground-dwellers, such as wallabies, that live in the undisturbed forest but feed on the new growth. Possums and gliders, however, prefer mature forest because of their need for tree hollows, which seldom appear until trees are older than about 60 years. Checks by Dr Braithwaite in one

forest showed most of the arboreal mammal species have now recolonised areas that were heavily logged in the 1920s.

Dr Braithwaite considers that a greater potential threat to our forest fauna exists in the north of the State. Between Dorrigo and Grafton lie forests of types with average arboreal-mammal density about 40 times greater than that in the forests of the Eden district. A pulp mill has been proposed for the region. If it bought timber from private land-owners it would presumably serve to accelerate land-clearing in the most fertile patches of forest — a repeat of the situation that has occurred in the south. It is this permanent loss of habitat from the best patches of forest that most threatens the survival of our unique tree-dwellers.

Roger Beckmann

More about the topic

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