

Isn't it funny how possums like hollows?

Anyone familiar with the tales of *Winnie the Pooh* will know that some animals are arboreal: they like to live in trees. They will also know that tree-dwellers have certain preferences when it comes to home selection. Owl's elevated hollow was in the Hundred Acre Wood, and the entrance to Rabbit's ground-floor dwelling was slightly smaller than the girth of a 'hunny'-laden bear.

While truth can be stranger than fiction, it is often more complex too. The characters that inhabit Australia's southern temperate forests are no less fussy about where they live. Accommodating their special needs is one of the tasks making forest management so difficult.

The need for an improved approach to the retention of hollow-bearing trees is highlighted by Phil Gibbons in a chapter of *Ecology and sustainability of southern temperate ecosystems*, a new book that draws together nine papers about forest management. Gibbons wrote the chapter while completing a Masters degree at the Australian National University. It is one of four in the book to address the impact of timber harvesting on native wildlife. Others discuss forest management; research and conservation priorities; the effects of global change; and the politics of ecologically-sustainable development.

Many old-growth forests contain an abundance of hollow-bearing trees. Hollows provide habitats for many animals. In Australia alone, some 400 vertebrate species use them.

Gibbons, who now works with the New South Wales National Parks and Wildlife Service, says timber harvesting in natural forests represents a potential threat to hollow-dependent fauna. Studies have shown that their populations may be reduced or eliminated when some or all hollow-bearing trees are removed. Logging cycles or rotation lengths are also typically shorter than the period required for trees to form hollows suitable for wildlife.

A number of factors affect this suitability, Gibbons says. Species may seek hollows on the basis of size, orientation, or surrounding vegetation. These requirements can be linked to the animal's physiology, or behavioural ecology. The overall dimensions of hollow-bearing trees can also be important. The size of the tree may correlate with the size and insulation properties of the hollows produced.

A number of mammal and bird species prefer hollows with small entrances. These can exclude competitors and predators and may have thermoregulatory benefits. Internal dimensions are important in determining occupation by some cockatoo species and the common brushtail and ringtail possums. The number of entrances may be important too.

Gibbons says when studying the hollow requirements of forest ecosystems, it cannot be assumed that unoccupied hollows are unused. Their use may be seasonal, or multiple. Greater gliders in south-east Queensland have been found to use three or four different dens a month and from four to 18 over 10 months. Yellow-bellied gliders also change dens frequently.

Territorial behaviour is exhibited by a number of hollow-dependent species. The greater glider generally will not recolonise new areas because of a high site-attachment and/or active defence of adjacent home ranges by others. Some marsupials and birds may defend vacant hollows from other species.

Forest owls rely on trees with hollows as nesting sites, and also because, for some species, their major food source is arboreal marsupials. It has been suggested that the powerful owl may consume 250-300 possums annually. A forested area of about 1000 hectares is needed to satisfy such an appetite.

Gibbons says ensuring continuity in the hollow resource over time is critical to effective forest wildlife management. For example, the future of the endangered Leadbeater's possum is uncertain because of an impending temporary dearth of hollow-bearing trees throughout much of its range. This could be the case in many forests with a long history of even-aged silviculture.

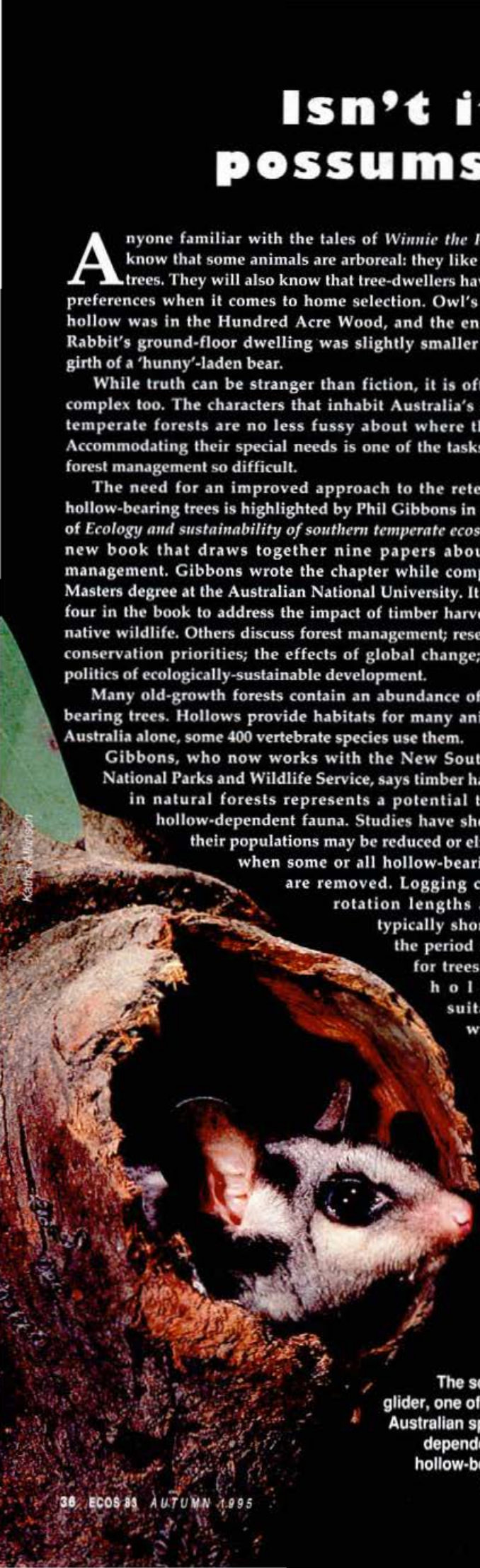
He says the retention of suitable hollow-bearing trees deserves greater emphasis in forest management strategies. These should be tailored to each specific site and its fauna, and incorporate a silvicultural system that maintains an uneven-aged forest structure.

Gibbons says an inventory of hollow-dependent fauna and their requirements is needed. Also, habitat-tree dynamics, decay transition rates and hollow ontogeny need to be modelled. Simple data such as which species return to different configurations of retained trees should be monitored, and trials conducted of various habitat-tree prescriptions.

Ecology and sustainability of southern temperate ecosystems is edited by Tony Norton and Steve Dovers of the Centre for Resource and Environmental Studies at the Australian National University. It is published by CSIRO Publications and costs \$39.95 plus \$6 postage (overseas US\$39.95 plus US\$6).

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The squirrel glider, one of many Australian species dependent on hollow-bearing trees.