

FORECASTING THE COLLAPSE OF TREES WITH HOLLOWES

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Many species of arboreal marsupials are dependent on hollows in trees for nest and den sites. In the montane ash forests of central Victoria, Australia, suitable hollows do not develop until trees are aged 120 years or more. However extensive bushfires in 1939 have ensured that many stands are even aged and very few new trees with hollows will be available until well into the second half of this century.

In these circumstances the maintenance of existing hollow-bearing trees is important to the survival of many species, including the endangered Leadbeater's possum, *Gymnobelideus leadbeateri*. Lindenmayer et al (1997) and Lindenmayer et al (1994) characterised decay by nine stages and used markovian models to predict the future decay through these stages of hollow-bearing trees on 132 sites, with somewhat gloomy results.

Of these sites 32 had been surveyed in 1983, 1988 and 1993, and the other 100 were surveyed in 1988 and 1993. Of the 32 sites surveyed in 1983 two have since been logged, but the rest were revisited in 2007. On these sites the survival of hollow-bearing trees appears to have been better than originally predicted. Ways of testing this formally will be discussed. Covariates such as tree diameter partially explain the improved survival, but the complete story seems to be quite complex making convincing long-term prediction difficult.

Lindenmayer DB, Cunningham RB, Donnelly CF (1997) Decay and collapse of trees with hollows in eastern Australian forests: impacts on arboreal marsupials. *Ecological Applications* 7:625-641

Lindenmayer DB, Cunningham RB, Tanton MB, Smith AP (1994) The conservation of arboreal marsupials in the montane ash forests of the Central Highlands of Victoria, South-east Australia: II. The loss of trees with hollows and its implications for the conservation of Leadbeater's possum *Gymnobelideus leadbeateri* McCoy (Marsupalia: Petauridae). *Biological Conservation* 54:133-145