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# Biodiversity values of timber plantations and restoration plantings for rainforest fauna in tropical and subtropical Australia

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## Abstract

It has been suggested that timber plantations could play an important role in the conservation of biodiversity in cleared rainforest landscapes, not only because of their potential to cost-effectively reforest large areas of land, but also because they may provide habitat for rainforest plants and animals. However, this last claim is largely untested. In this study, we surveyed the occurrence of a range of animal taxa in monoculture and mixed species timber plantations and restoration plantings in tropical and subtropical Australia. We used the richness of 'rainforest-dependent' taxa (i.e., birds, lizards and mites associated with rainforest habitats) in reforested sites as our measure of their 'biodiversity value'. We also examined whether the biodiversity value of reforested sites was correlated with habitat attributes, including plant species richness and vegetation structure and, further, whether biodiversity value was affected by the proximity of reforested sites to intact rainforest. In general, our results showed that: young timber plantations (both monoculture and mixed species) supported few rainforest taxa; Birds associated with rainforests were poorly represented in young timber plantations, but were moderately common in restoration plantings; Few rainforest lizards were recorded in young reforested sites, except in restoration plantings in the tropics; Rainforest mites were generally detected more frequently in restoration plantings than cabinet timber plantations, while the richness of rainforest mites in monoculture plantations varied between regions; The richness of rainforest birds in young reforested sites was positively correlated with plant species diversity and structural complexity, with similar correlations observed for rainforest lizards in the tropics; Rainforest mite richness was poorly correlated with measured habitat variables; and that Monoculture plantations close to intact forest tended to support more rainforest birds, lizards and mites than isolated plantations. These results suggest that plantations are likely to have limited value for rainforest taxa under conditions which often characterise broadscale reforestation: i.e., when plantations are established on cleared land, at some distance from intact forest and when plantations are managed intensively for timber production.

Management of plantations for their faunal biodiversity values is likely to require the development of explicit design, management and harvest protocols, such as the incorporation of habitat features into plantations and/ or the reservation or restoration of native forest on part of the plantation estate.

### Citation

Kanowski, John and Catterrall, Carla and Proctor, Heather and Reis, Terry and Tucker, Nigel and Wardell-Johnson, Grant. 2005. Biodiversity values of timber plantations and restoration plantings for rainforest fauna in tropical and subtropical Australia, in Erskine, P. and Lamb, D. and Bristow, M. (ed), Reforestation in the Tropics and Subtropics of Australia Using Rainforest Tree Species. pp. 183-205. Australia: Rainforest CRC.

### Source Title

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### Remarks

Reforestation in the Tropics and Subtropics of Australia Using Rainforest Tree Species. \$55.00. 333 pages. Code: 05-087. Published: 20 Jul 2005. Author(s): Edited by Peter D. Erskine, David Lamb, Mila Bristow. ISBN: 1-74151-150-X

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Curtin University would like to pay our respect to the indigenous members of our community by acknowledging the traditional owners of the land on which the Bentley Campus is located, the Wadjuk people of the Nyungar Nation; and on our Kalgoorlie Campus, the Wongutha people of the North-Eastern Goldfields.

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A tropical rainforest is the richest biome in the world and is one of the most diverse and productive biomes on Earth. It is rich in biodiversity and lies in a broad equatorial belt of Earth typically between the Tropics of Cancer and Capricorn. (Note: A biome is a specific geographic region on Earth with similar climatic conditions and is notable for the living species in the region. There are two major biomes on Earth - Terrestrial Biome and Aquatic Biome. A biome includes both abiotic (non-living) and biotic (living) factors.) The largest tropical rainforests of the world are found in the e Rainforest timber plantations and the restoration of plant biodiversity in tropical and subtropical Australia. Article. Full-text available. We also examined whether the biodiversity value of reforested sites was correlated with habitat attributes, including plant species richness and vegetation structure and, further, whether biodiversity value was affected by the proximity of reforested sites to intact rainforest. Tropical rainforest flora existed in the wettest areas of the north and north-east [37, 38]. The mean values of these transect records defined the Foliage Projective Covers (FPC) in the overstorey and understorey strata of the plant community. Alpha Biodiversity of plant communities can be assessed by recording the increase in species richness to an asymptotic value as the area of the quadrat increased in size—the species-area curve [122–124]. The biodiversity of the flora and fauna in the open-structured plant communities of much of Australia has survived over 50 million years on soils rich in kaolinite that fixes phosphates in an unavailable form within its clay lattice. Today, these ecosystems are under threat from phosphate pollution [4, 69, 84, 152–156].