

Australian Rainforests: Island of Green in a Land of Fire, D.M.S. Bowman, Cambridge University Press, Cambridge 2001. ISBN 0 521 46568 0 (hb). 344pp.

It is relatively rare, in present-day ecology, that a single author can assemble more than 300 pages of evidence and argument to address a single problematic issue. Indeed, this diligently constructed treatise reads rather as an extended review article, with data and opinion from previous authors interwoven into the argument as it develops. The resulting volume is something of a magnum opus, and David Bowman is to be congratulated on a thorough and thought-provoking presentation. Not everyone will agree with his conclusions; indeed, as he says in the Preface (p. xi), "Len Webb and Jiro Kikkawa... suggested that I write a book, although probably not this book, on Australian Rainforests."

The question addressed seems deceptively simple: why is the distribution of rainforest in Australia so patchy? Bowman's conclusion is foreshadowed in the subtitle. After introductory chapters that discuss definitions and characteristics of rainforest in Australia, Bowman critically examines various hypotheses to explain its current distribution. He discusses, but dismisses, suggestions that rainforest distribution is controlled by soil phosphorus or other soil characteristics; that rainforest is restricted to permanently drought-free sites; and that it is otherwise moisture-dependent or limited by minimum temperatures.

He argues (p. 162) that "the boundary of tropical rainforests is determined by the interaction of topography, soil fertility and fire history" (p. 162). Monsoon rainforests, he argues, can recover from occasional fires but are largely restricted to sites with topographic protection from recurring fires (p. 166). He ascribes a relatively minor role to Aboriginal burning (p. 229), partly on the basis of palynological evidence. His conclusion is that "the boundaries between rainforest and non-rainforest vegetation are determined by the frequency of wildfire. This generalization holds across a latitudinal gradient from 12°S in the monsoon tropics to 44°S in Tasmania, and includes all rainforest environments on the east coast of Australia." In two brief concluding chapters, he then examines how flammable forests may have evolved, and why fire management in adjacent areas is a critical component of rainforest conservation. For example, he mentions rainforest attrition caused by burning sugarcane; weed invasion in burnt areas; and fuel-control burns in the Kimberley area, using fire-bombs. As a member of an educational group that was once fire-bombed in a remote area of the Kimberley despite having a permit from the very same agency, I can testify that "controlled" may not be an appropriate term. After their tents and backpacks went up in flames, we had what can only be described as unhappy campers on our hands!

Bowman's interest and expertise in this area is well-known and long-standing. Indeed, over 40 of his own previous publications are cited, along with an enormous range of work by other Australian ecologists. The storyline reads authoritatively and it seems petty to cavil, but I must confess to one or two lingering doubts. The most basic and perhaps most important is very simple: is it really reasonable to consider such diverse vegetation types as southern beech in Tasmania, wet sclerophyll in Victoria, brush box and cedar in north-east New South Wales, cloud forest on the New South Wales/Queensland border, vine thickets in northwest Western Australia, and the complex forests of the Queensland wet tropics, all under the one general heading of rainforest; or is that really too much of an over-simplification? And in the same vein,

even if all these different types of wet closed-canopy vegetation have patchy distributions, why should we expect that similar mechanisms are involved in each case? Has Bowman perhaps done himself a disservice by forcing himself to make a single overall choice between soil, climate and fire?

From the illustrations in this book, for example, one gains the impression that boundaries between rainforest and *Eucalyptus* forest are always extremely sharp; and indeed, sometimes they are. But in the complex wet forest of north-east New South Wales and south-east Queensland, for example, there are large old eucalypts just as there are large old cedars, hoop pines, carrabeens or stinging trees. Indeed, the legal battles over Terania Creek, alluded to on p.46, hinged on the vexed question whether these are eucalypt forests with rainforest understorey, or rainforests with emergent eucalypts. Similarly, I am not entirely convinced that open sedgeland in Tasmania are necessarily fire-controlled. What about shallow bedrock and seasonal waterlogging? There are open sedgelands elsewhere in Australia that are surrounded by eucalypt forest, not rainforest. How does fire explain this?

My only other significant complaint is that the evidence presented emphasizes distributional data (at the macro scale), and physiological data (at the micro scale). Rather little attention is paid to population and community ecology, at the meso scale. For example, how often do various rainforest tree species set seed, how susceptible to fire are their seedlings and saplings, how does the timescale of successful recruitment compare with the recurrence intervals of wildfires, and so on?

Of course, it is unreasonable to expect that anyone can address all facets of such a complex problem, even in a 300-page book, and Bowman is certainly to be congratulated for assembling such a wealth of data in such a structured form. I am sure that this will not be the last word on this issue. Indeed, I am optimistic that his book will spur a burst of new research on a topic as significant for biodiversity conservation as it is for ecological understanding.

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