

Australia's Biodiversity and Climate Change

W. Steffen, A. A. Burbidge, L. Hughes, R. Kitching, D. Lindenmayer, W. Musgrave, M. Stafford Smith, P. A. Werner (eds). CSIRO Publishing, Collingwood, 2009. 248 pp. Price A\$69.95 (paperback). ISBN 9780643096059.

This book is a solid summary of the current situation, by the Australian Government's Expert Advisory 13 Group on Biodiversity and Climate Change. It includes lots of good information, is logically assembled and well presented. The book is published by Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Australian Government and has a 'CSIRO report' style, covering the bases broadly rather than homing in or hammering home a single point. It assembles research from a range of sources, but it is not in itself a research publication. It will be a useful reference for natural resource management coordinators, but it is too detailed to be read by practising politicians. It will be useful in teaching, though the introductory chapters should already be familiar to most biology students.

There are eight chapters with text boxes by additional contributors. Some of these are referenced, some not. There are no lists of text boxes or contributing authors, figures or tables. There is no summary, and the introduction reads as terms of reference. Chapters two and three provide an overview of Australian biodiversity, its origins and values. Figure 3.7 (p. 30) seems to have a printing error, with countries in sub-Saharan Africa shown using the same symbols and colours as those in central Asia.

Chapter four provides a condensed overview of climate change projections, using relatively complex graphical presentations. References are a little confusing. For example, figures 4.5 and 4.6 (p. 60) are based on a 2007 article in *Science*, with 2008 data provided by two of the authors of that article but referenced to the American Association for the Advancement of Science. Similarly, the caption to figure 7.1 on p. 145 refers to the Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report but actually references the Fourth.

For a number of climate change parameters, measured values in recent years exceed even the 'worst-case' IPCC scenarios, so-called business as usual. This is entirely unsurprising, since business, in fact, continues to grow; and the \$5 trillion 'economic crisis' of the last couple of years was a barely detectable blip in its growth. The simplified comparison in figure 7.2 (p. 145), showing the IPCC's

'runaway', 'stabilization' and 'recovery' scenarios mentions that 'runaway' is in fact only 'business as usual'. It does not mention, however, that it is at least as likely, if not even more so, 58 that economic growth and carbon emissions will continue to accelerate, so that climate change may well 60 exceed even the 'runaway' scenario.

Chapter five is perhaps the core of the book, reviewing research on actual and projected responses of Australian species and ecosystems to climate change. There are generalized discussions of lags, thresholds, feedback and nonlinearity; and examples drawn from a range of terrestrial and marine ecosystems.

Chapter six argues that current approaches to conservation policy, themselves relatively weak, will be even less effective under climate change. It suggests four now-standard adaptive responses: enhanced resilience, landscape connectivity, enlarged reserves and ex-situ conservation. Off-reserve conservation and ecosystem restoration are mentioned, but barely. The authors note the 'historical dominance of production industries over conservation' (p. 140) but they argue for combining the two on the same landscape. Perhaps what they have in mind is the conversion of production forests and private farmland to conservation. But the forestry, fisheries and mining industries will interpret this phrase to mean that they should have access to protected areas.

Chapter seven provides a synthesis, largely through some multi-page fine-print tables. Table 7.1 (pp. 154-158) contrasts biodiversity management under 'stationary' and 'changing' climates. Most strategies listed, however, would apply equally to both. Table 7.2 suggests funding mechanisms for conservation in different landscapes: amenity migrants, conservation stewardship payments, carbon offsets, industry levies and land buy-backs. These have been debated for decades: each is possible, but none is easy. Other suggestions are: an annual national forum; a national biodiversity trust; and a new profession of biodiversity conservation facilitators. Nature conservation trusts already exist. The profession of private conservation broker also exists in the USA, supported by tax arrangements for conservation easements that do not yet apply in Australia.

A short concluding chapter argues only for: new approaches, public debate, more funding, better governance and emission mitigation as well as adaptation. These are broad and generalized, so the federal government can endorse them without political risk. The strength of this volume therefore is not in its rather weak policy recommendations, but in the large central synthesis chapter on impacts, and the subsequent discussions on potential management approaches.