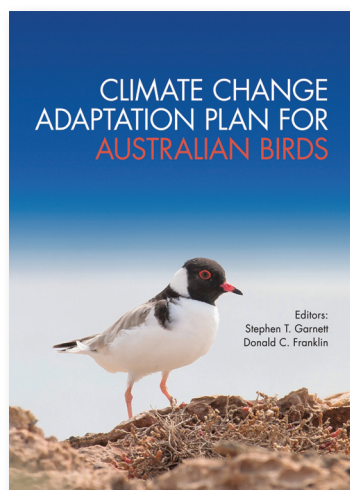


Book Reviews



Climate Change Adaptation Plan for Australian Birds

Stephen T. Garnett and Donald C. Franklin (Eds), 2014. CSIRO Publishing, Paperback, 272 pp. ISBN: 9780643097667. RRP \$69.95.

Given the importance of climate change to the Australian environment and the ubiquity of its impacts on the continent's biodiversity, books such as this one - that document predicted climate change impacts on a particular aspect of biodiversity in a rigorous and comprehensive way - are very important to the conservation and scientific communities. No other faunal group are as well studied, by professional and 'citizen' scientists, as birds, making them the perfect focus for a detailed assessment of the extent and breadth of climate change effects that cuts across almost every known ecosystem in Australia. Finally, editors Stephen Garnett and Don Franklin, along with contributing authors, Glenn Ehmke, Lauren Hodgson, Chris Pavey, April Reside, Jeremy VanDerWal and Justin Welbergen bring decades of experience in ornithology, ecology and conservation biology to this book, giving it credibility and weight. This is not a book for the amateur bird enthusiast or those with a passing interest in climate change - the complex ideas and analyses somewhat limiting its audience in this respect. However, it is a comprehensive and valuable resource for anyone involved in avian ecology, biodiversity conservation, climate change impact assessment or land management in Australia.

Climate change and its impacts are inherently uncertain, as are animals' responses to varying environmental conditions, making the book's detailed predictions about the exposure and sensitivity of various bird species to climate change (over a 73 year time frame) somewhat brave. However, the authors are completely aware of this fact and very transparent about their assumptions and the limitations of the data. They acknowledge early on in the Introduction that the book should not be read as a definitive or prescriptive analysis, rather, that the profile for each taxon presented should be interpreted as '*...a hypothesis which will be tested in time.*' The introductory chapters go on to describe in detail the various methods employed to quantify each species' vulnerability to climate change - a combination of both its *exposure* and its *sensitivity*.

Exposure is calculated using climate space modelling, which relates observation records (about 16.5 million in total) to eight climatic variables (aspects of temperature and rainfall) to create a current and future (2085) *climate space* (geographic area in which climatic conditions are predicted to be suitable).

Essentially, those species whose future climate space under climate change is very different to their current climate space (i.e. the areas have little overlap), are deemed highly exposed. The book defines sensitivity as the predicted ability (or lack thereof) of species to adapt to climate change impacts, specifically changes to environmental conditions associated with a shifting climate space. This index is comprised of three components; *specialisation* (species with narrowly-defined and/or inflexible ecological requirements are less likely to be adaptable), *genetic diversity* (low genetic diversity limits species' capacity to evolve) and *life history* (species with lower rates of reproduction are less likely to be adaptable).

The authors go to great lengths to explain these very complex ideas in clear and simple language, and generally succeed. Many of the concepts presented, however, require at least some tertiary-level knowledge of ecology and/or quantitative modelling. This shouldn't dissuade readers who are interested in the vulnerability to climate change of particular species or groups, as the individual profiles are relatively straightforward to interpret and provide useful, detailed, species-specific information.

For those interested in the bigger picture, the chapter on vulnerability provides some clear representations of emergent patterns in how climate change is likely to impact on birds and their habitats across the continent and across functional groups. For example, demonstrating that species inhabiting small islands are likely to be more vulnerable than those in other habitats, and those occurring on the Cape York Peninsula likely to be more vulnerable than those from other geographic regions. This chapter really brings together the analyses to provide a holistic view of the situation facing Australia's birds under climate change.

For conservation managers, the last of the introductory chapters - on conserving Australia's bird populations - is obviously not a comprehensive manual. The broad challenges associated with managing species and habitats to promote resilience and resilience to climate change impacts are discussed in a knowledgeable and articulate manner. One criticism of this part of the book, would be the manner in which the more interventionist strategies for recovering species are discussed. The authors acknowledge the considerable uncertainty associated with wildlife management, particularly under climate change. What they don't address well, however, is the relative costs associated with different strategies and how this should inform decision-making. Over the past decade discussion of the use of cost-benefit analyses, objective prioritisation and triage techniques in the context of wildlife management has proliferated in the conservation biology literature. It would have been beneficial (and timely) to reference these ideas in relation to making decisions about, for example, managing habitat connectivity versus captive breeding as effective strategies for combating climate change impacts to particular bird species.

The key content of this publication - and its value as a reference text - lies in the individual species profiles. Detailed profiles are presented for 59 bird species that have been determined to be either very highly exposed or very highly sensitive to climate change. Given the book's broad scope,

the profiles themselves are relatively in-depth and data-rich. The authors include a justification for their determination as vulnerable to climate change, recommended adaptation responses, basic ecology, population trends, threats and existing management. Each profile also contains a breakdown of the various factors associated with climate change exposure and sensitivity, and how the species rates against each. These include additional analyses for seabirds that quantify exposure to marine productivity decline. The maps illustrating current and future climate space and core distribution are informative and precise (for those really interested in the distribution models, the spatial data layers for all species are available for free online at <http://spatialecology.jcu.edu.au/Edgar>), and include oceanic maps of marine productivity for relevant species.

I have two minor criticisms; the first being that, although the species profiles include a summary of estimated adaptation costs over 50 years, these costs are too coarse to be useful to

conservation planners and are not referred to by the authors in the context of informing decision-making. The second, being the fact that species are listed in the Appendix by taxonomic group, but without any subheadings, making quick reference to a particular species difficult without a comprehensive knowledge of bird classification.

As it states in the Foreword, this book ‘marks the first attempt, at a continental scale, to assess the scale of [climate change impacts] for Australian birds.’ It is a good starting point for those evaluating and planning for risks associated with climate change in biodiversity management. I recommend the book to anyone interested in these issues from an academic or more practical perspective, and would strongly encourage others to apply Garnett and Franklin’s approach to other taxonomic groups.

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The World of Birds

Jonathon Elphick, 2014.
CSIRO Publishing.
Hardcover, 610 pp,
coloured photographs and
drawings. ISBN: 9781 486
30292 5. RRP \$89.95.

This book was first published by the Natural History Museum, London and has now been released in Australia by CSIRO Publishing in partnership with the NHM. The writer

has written many books on ornithology and is well known in the British ornithological world.

This substantial tome of 610 pages could be described as a coffee table book on account of its profuse illustrations, but it is also a scientific summary of our knowledge of the birds of the world and so should appeal to a broad range of readers.

It is really two books in one. The first nine chapters cover aspects of bird biology - early birds, anatomy and physiology, flight, food and feeding, bird society and populations, breeding, where birds live, migration, and birds and humans.

The second half is a description of the 195 currently recognised bird families, grouped into 32 orders. Within each family is a box of figures and facts, including number of genera and species, range and habitat, food, migration and conservation status, followed by a descriptive summary of the group and its relationships. With more than 10 000 bird species recognised in the world, it is impossible to refer to every one, and generally only significant or atypical species are mentioned, but many more appear in the photos.

The author has adopted a conservative approach in classification and generally follows the Howard and Moore

Checklist (2003) but he readily admits that some of the taxonomy he has recognised in the book may change in the future as DNA analyses reveal new relationships between birds.

The book’s prime market is English-speaking Northern Hemisphere countries and English or American examples are most often cited. It is tempting to label the book as another example of Northern Hemisphere bias but many species from Australia and New Zealand are also mentioned. The author accepts that the early passerine radiation had its source in Gondwanaland and that many of the Australian endemic families can be traced back to these ancient groups.

The book contains many stunning photos but they do not dominate the book. One disappointment was the image of a satin bowerbird’s head - it did not do justice to the brilliant lilac eye; perhaps that was an artefact of the colour printing process. Many excellent drawings in the first half of the book illustrate the skeleton, circulatory system, respiratory system, feathers and the reproductive system.

Some minor irritations include the predominant use of English examples when discussing aspects of bird biology. Another is the repetitive insertion of “(known in North America as shorebirds)” following every use of the word “wader”. In the section on buttonquails, their occurrence in Australasia is completely overlooked - the southernmost range is given as the Philippines and Indonesia!

Overall I found the book very informative and enlightening. I was very surprised by the avian diversity in the world; I had never heard of birds such as kagus, mesites and limpkins. In particular, the lucid illustrated explanations of biological processes make this a valuable resource for anyone wishing to progress beyond knowing what bird that is and where it lives.

Dickinson, E. (2003). ‘The Howard and Moore Complete Checklist of the Birds of the World. 3rd edn’. (Christopher Helm: London).

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