

wildlife tourism. Chapter 9 finishes with future directions for research in wildlife tourism. The authors advocate the continuation of empirical research in ecology to learn more about the relevant ecosystems.

My overall impression is that the book is very good. As an ecologist, who has conducted research in areas of high conservation value as well as made the occasional foray as a wildlife tourist in other countries, I easily relate to the biological content. What I find exciting about this book is its incorporating the social sciences into managing wildlife. I found Chapters 3 to 6 wonderful introductions into various disciplines of the social sciences that are highly relevant for managing wildlife. For me, these chapters are the strength of this book and make it a necessary addition to the library of anyone who is interested in wildlife management. The chapters on wildlife biology and experimental

design are useful, but I am more familiar with experimental design and statistics than I am with psychology, engaging stakeholders and policy. Thus, I learnt more from Chapters 3 to 6 than I did from the others. However, my kind, the wildlife ecologist, is not part of the intended audience of this book. Wildlife ecologists probably ought to be part of the target audience, so that we learn the significance of managing wildlife in a social and political context.

I particularly like the Adaptive Management Framework since it has the potential to operate effectively in the social and political context of wildlife conservation, as well as make effective use of observational and experimental research. This book provides a balanced view of the range of disciplines that need to be considered when managing wildlife. It will be a particularly useful resource book in your professional library.

Australia's Mammal Extinctions: A 50 000 year History

Chris Johnson, 2006
Cambridge University Press, Cambridge
288 pp. ISBN 13: 97805-21686600
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TIM FLANNERY'S *The Future Eaters* holistic ecological history invigorated Australians and took ecology to the dinner table and into the pub. It was a monumental achievement. The problem with *The Future Eaters* for many Australian ecologists was that despite the wonderful prose and apparently beautiful logic of the simple story many of the details did not seem to add up or were presented rhetorically. At the time of reading, I had just finished a survey of the dry rainforests along the eastern seaboard and there were many features of these ecologically tantalizing environments that were incompatible with them as the "relic" environments central to Flannery's story (Fensham 1995). The contribution of *The Future Eaters* as a provocateur of debate was immense, but it had ultimate shortcomings because Flannery could not afford the forensic scrutiny required, in a book that was packaged as a popular best seller.

Twelve years after *The Future Eaters* we have Chris Johnson's *Australia's Mammal Extinctions*. This amazing book does far more than just tell a convincing and coherent story of the fate of the mammals during quaternary history. In many ways it is a model science

story. I am not sure if it is Johnson's invention, but the central framework provides a superb way of sorting vast and complex, but ultimately patchy evidence. The framework is provided by three tests applied to the potential agents for each of the three major waves of mammal extinction in Australia; the Pleistocene megafauna, mainland marsupial predators in the mid-Holocene, and "critical weight range" mammals in the European era. The acid tests are: *Do they fit the spatial and temporal patterns?*, *Can they explain consistent morphological and ecological features of the target species?*, and *Is the mechanism logically consistent with the characteristics of the agent and target?* These three tests sort disparate evidence through space and time for mechanisms that will logically have different outcomes. The result is a compelling charge sheet pinning the primary agents for the three extinction events as people, people, foxes/cats respectively; or in short **predators**. The delivery of this process takes a neat 230 pages without being overly arduous, but also leaves barely a stone of important evidence unturned. Johnson provides the perfect balance between concession to uncertainties and the delivery of a decisive story. The only part of the book that I found convoluted was the presentation of the palynological evidence, for which without being selective it seems almost impossible to deliver a decisive story. Certainly there is plenty of room for the skeptic to wonder whether there were really very different trends of fire and vegetation history across the continent, or whether a selective

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analysis based on some indices of reliability are required.

The lessons for current mammal conservation could be profound. Should we spend less time and effort worrying about fire management? Could grazing impacts by placental megafauna (domestic stock and feral animals) be compatible with fauna conservation? Can human hunting restore balance? Should we pull out all stops to eradicate foxes from Tasmania? Do we need a major rethink of the importance of dingoes? Most of these questions are not directly proposed by Johnson but the last is addressed fair and square. Johnson believes that dingoes may be critical for subduing predation pressure by foxes and cats. Supporting evidence from a classic data-set (strangely not included by Johnson) of Australian ecology (Caughley *et al.* 1980) also suggests that they provide balance for ecological function further down the food chain. It is this challenge to current management that has already stimulated an email debate among natural resource practitioners within my agency.

Johnson's book comes on the back of many attempts to use modelling procedures to tease out the multiplicity of factors that might have caused the critical weight range extinctions. The latest comes after the publication of this book (McKenzie *et al.* 2007) and comes to the conclusion that it is all very complex. Johnson locked himself away and gave the topic some deep reflective thought, and the conclusions for me are much more convincing than those left up to the judgement of an obscure but increasingly popular Japanese gentleman by the name of Hirotugu Akaike, whose perfectly logical statistical weighting procedure can never replace the combination of field knowledge, historical sense and wisdom to generate ecological insight.

As Johnson points out many of the assertions that bind his thesis may be testable, but not easily. Despite potentially profound impacts predators, particularly in arid areas, can be hard to find and cunning research approaches are needed. A recent study makes a highly worthy contribution by employing Aboriginal trackers to collect data (Southgate *et al.* 2007). Another study that has emerged after the book provides findings that are only partially supportive of Johnson's thesis (Davey *et al.* 2006).

Cambridge University Press is to be congratulated on the presentation. The soft-back/hard-back hybrid packaging is very groovy, the superb graphics always illustrate a key point and the photos are first-class. Gazing at the Gould plates of those extraordinarily beautiful animals I drifted into a tearful but profound state that gave a spiritual dimension to this book about extinction — only yesterday in evolutionary time.

This brilliant and important book will provide a springboard for future research effort and synthesis.

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