

What Makes a Good Farm for Wildlife

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MY first impressions on flipping through the pages of this book are that the layout is superb and well-organized, and the combination of text, good colour photos, diagrams and box text should appeal to a wide audience. Do we need another book on this topic and, if so, what makes this one different? As a conservation practitioner and ornithologist/ecologist living in north-west Tasmania what I like most about this book and what makes it different is the way David Lindenmayer and his team communicate their research findings to the lay public in a refreshing manner with clear, practical messages and interesting facets of plant-animal interactions of both vertebrates and invertebrates.

The book has seven chapters each of which ends with a good reference list. The first introductory chapter briefly introduces temperate woodlands, especially those of the South West Slopes of New South Wales upon which the research is based, then follows with the ecosystem and financial benefits of conserving biodiversity on the farm. Box 1.2 stresses the importance of setting objectives and management actions on what is to be achieved, whether it's restoring habitat for a suite of species, a particular species or for ecological functions and processes. The final part of chapter 1 presents a diagram that identifies five key environmental farm assets that collectively make up a good farm for wildlife. Each of these five assets; remnants, plantings, paddocks, rocky outcrops and waterways; forms a separate chapter (chapters 2-6). Each chapter on one of the five assets begins with a box outlining the features that make each asset a good one.

Chapter 2 "What makes a good remnant" describes three vegetation layers, i) the ground layer, ii) the understorey layer, and iii) the overstorey layer, and for each layer there is a good discussion of the threats to and management of each layer. For example, Box 2.1 and Figure 2.2 illustrate the different beetle assemblages found in the leaf litter of two eucalypt species. I suspect there are also different arthropod assemblages associated with the foliage and bark of different eucalypt species and of wattles. This information could have been included to emphasize the importance of retaining and restoring tree and shrub diversity for invertebrate diversity. Box 2.5 mentions that prickly shrubs, such as *Bursaria*, provide habitat for small birds but the authors could also have mentioned that *Bursaria* flowers are an important food source for insects such as parasitic wasps and flies.

In chapter 3 "What makes a good planting?" it is reassuring that the authors' research reveals that good plantings are effective for biodiversity conservation. A key research finding was that a farm with plantings tends to have different animal species (e.g., birds) than areas of remnant native vegetation so together plantings and remnants have more species than a farm with no plantings. This chapter addresses practical questions like "where should you plant?", "how big should your planting be?" "what shape should a planting be?" and "what should you plant?" The authors emphasize planting local native trees and shrubs but apart from eucalypts and wattles don't specify any other plant groups. I'm not familiar with understorey plant families represented in temperate woodlands of the South West Slopes but I'm sure the authors could have chosen a few whether it's the pea, myrtle, banksia or daisy families that are, for example, important for farm and regional invertebrate diversity. Perhaps they could have included a few references to the overstorey, understorey and ground layer plants associated with different woodland plant communities. The authors mention that microclimate needs to be considered in selecting species for plantings. They could have mentioned also that in a nutshell suitable plant selection for plantings is simply to match the geology, soils, aspect, elevation and microclimate of your site with the native plants in remnants on similar sites on your farm, your neighbour's farm or in the surrounding landscape. This chapter gives many practical tips on establishing and managing plantings but three that I found interesting are i) to keep dead shrubs and trees in plantings so I assume that includes both standing and fallen plants, ii) to add fallen timber especially large logs, and iii) to plant shrubs in thickets and leave some open areas between the thickets. This is a good recommendation to improve the condition of some remnants and for replanting areas, and is sure to benefit some ground-foraging, understorey-nesting birds. Within and at the edges of plantings there could also be patches with only shrubs and ground layer plants and no tall overstorey.

The next two chapters, 4 & 5 respectively, "What makes a good paddock for biodiversity?" and "What makes a good rocky outcrop?" discuss important assets that are often undervalued. Chapter 4 covers paddock trees, native pastures and fallen timber. Paddock trees are critical keystone structures for woodland biodiversity so this chapter begins with their multiple values and addresses real threats to and urgent management actions required for their continuing survival and regeneration. Fallen timber and large logs are important for fauna diversity, especially beetles, so the authors make a plea to leave

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timber and logs on the ground or relocate them to other sites such as plantings, and limit or exclude commercial firewood collection. I agree that native grassy areas are best retained for farm production and wildlife and not planted to trees.

In chapter 5 we learn that rocky outcrops have high conservation value, especially for reptiles. Thus if revegetation is needed then a good idea is to plant trees and shrubs on the south side of a rocky hill so as to provide a sunny aspect for basking reptiles. The timing of management actions to minimize disturbance to wildlife, especially when they are breeding, is not emphasized enough so it was refreshing to read (Box 5.3) when it is the best time to rip and fumigate rabbit burrows so as to conserve the declining Inland Carpet Python.

Waterways include streams, creeks, wetlands, farm dams and channels. Chapter 6, "What makes a good waterway" describes the features of good waterways, gives reasons why they are important for biodiversity, and discusses threats and their management. Waterways are vital for farm business and biodiversity. Some examples given are that riparian bird assemblages are different and bird diversity is often higher than other in other places. We learn that earth banks provide nesting sites for bank-tunnelling birds so if required earth banks could be constructed for birds such as pardalotes.

Chapters 2–6 focus on five key environmental assets. Collectively these assets make a good farm and this is the focus of the final chapter 7. These five vegetation assets combine to form variation in native vegetation on farms and it's this habitat diversity that contributes strongly to farm biodiversity. The authors advocate that integrating agricultural production and biodiversity conservation

is best guided by a whole farm plan. Mapping the environmental assets of a farm, doing an audit of them and prioritizing management actions are good ways of managing these assets (Box 7.4). Many species of wildlife range beyond farm boundaries and need habitat connectivity for dispersal so the authors argue that measures such as feral predator control and other actions to conserve biodiversity need to be co-ordinated with neighbours across landscapes.

"What makes a good farm for wildlife" by David Lindenmayer and his team is an excellent well-presented book based on a decade of ecological research on farms located within the temperate woodlands of the South West Slopes of New South Wales. It should be essential reading for a wide audience especially people wanting to take action and gain a greater understanding of the features, conservation values, threats and management actions required to protect and restore key environmental assets on farms and landscapes in south-eastern Australia generally and the South West Slopes of New South Wales in particular. The book has many practical management actions for farms and surrounding landscapes and contains much information of interest to just about everyone. For example, it is well-known that wattles are nitrogen-fixing plants, but who would have thought that tannins from black wattles reduce numbers of intestinal parasites in sheep. At a landscape scale we learn that recent research suggests that past large-scale land clearing in the Murray-Darling Basin has contributed to recent droughts. This is a clear message that we need to invest much more in large-scale restoration of woodland landscapes for biodiversity conservation, food security and climate mitigation.

The Natural History of Sydney

Dan Lunney, Pat Hutchings and Dieter Hochuli (eds.)
 Royal Zoological Society of New South Wales
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AUSTRALIA'S relatively recent discovery by Europeans and rapid loss of traditional knowledge without documentation means the accumulated knowledge of our natural history is scant compared to other continents (e.g., search for publications on the top-order predators of each continent for confirmation). Yet, as Mike Archer highlights in the Foreword to this book, this natural history information is fundamental for us to develop effective conservation strategies. Instead of focusing on accumulating this information, the competitive nature of academia limits the value of publishing

simple natural history studies because of the low impact such studies invariably have (see Paul Adam's chapter), while conservation managers are too busy to publish their natural history research particularly while they receive such little incentive to do so. *The Natural History of Sydney* offers a valuable remedy to this problem and Dan Lunney and his Royal Zoological Society of NSW editorial team deliver once again in servicing the intellectual needs of Australian zoologists.

This is an interdisciplinary book that draws on the expertise of ecologists, zoologists, historians, anthropologists, archaeologists, and dedicated amateurs to derive a holistic view of Sydney's natural history. The 31 data chapters can be broken into two main themes — the environmental change associated with Sydney's urbanisation from both an ecological and anthropological viewpoint, and the resilience of biodiversity in the face of these changes. Despite these broad themes, no two chapters address the

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issue in the same manner. The book begins with an assessment of Sydney's natural history from an Aboriginal perspective via fishing in the harbour and Goodall's interesting story of Burruga at Salt Pan Creek, which shows the beginnings of a working class conservation ethic, although the desire to protect indigenous fauna but remove indigenous people seems sadly typical of the time. Nicholas' report on Charles Darwin's brief stay in Sydney suggests the great man had bigger things on his mind after his Galapagos sojourn; however, subsequent chapters on the original fauna of Sydney suggest we may have benefited from more collecting by Darwin and his shooter, Syms Covington. These chapters describe the original frog (Lemckert), mollusc (Beechey), fish (Booth), bird (Major) and invertebrate (Peters *et al.* and Moulds) fauna of Sydney through museum, survey and observational records, as well as through Aboriginal rock art (Taçon *et al.*). These and subsequent chapters illustrate aspects of Sydney's natural history and these chapters are the real strength of the book in my opinion. Glen Shea's and Hal Cogger's chapters that describe the original and persisting herpetofauna of Sydney and assessments of why the survivors have survived will also be a valuable reference for the future. Similarly, the reviews of the fauna of Botany Bay (White), Wolli Valley (Little *et al.*), Narrabeen Lagoon (Harris *et al.*) and Ham Common (Burgin) could prove useful, although I was disappointed to see that the Duffy's Forest endangered ecological community had been named after the person who cleared most of the forest and I wasn't convinced that Ham Common had retained as much of its original fauna as claimed because I felt the conservative selection of original inhabitants (such as excluding quolls and bettongs) biased the results somewhat. Wilks contends that Kuring-gai Council reserves provide important corridors through the legacy of visionary people, however an inspection of Figure 2 suggests the fragmenting effect of the Pacific Highway is hard to deal with. Nonetheless, the implementation of the threat abatement strategies augurs well for the LGA's biodiversity in the future.

There are also some really outstanding contributions on other issues that are relevant to conservation. Chapters by Paul Adam and Mike Augée review the history of natural history from being dominated by amateurs, through to the professional era and highlight the demise of a key field of human knowledge largely through the replacement with a sexier name — ecology — and yet basic natural history information is required for us to effectively conserve our biodiversity (Hayward and Somers 2009). Martin Denny's documentation of the fauna monitoring in Sydney over time illustrates the inadequacy of the long-term systematic and repeatable monitoring conducted then and now. Pat Hutchings highlighted the importance of the Australian Museum in valuing Sydney's natural history however the conclusion is that the Australian Museum faces a similar future to many research organisations where problems of increasing bureaucracy, particularly for OH&S, has increased employment opportunities for bureaucrats at the expense of scientists. Wotherspoon & Burgin provide 10 case studies that illustrate the ineffectiveness of environmental consultancy in stemming the erosion

of Cumberland Plain Woodland by 100 cuts. Tozer analyses Cumberland Plain Woodland and finds that it occupies a unique ecological niche compared to other NSW Coastal Valley Grassy Woodlands, which is important given the amount of focus and resources spent on conserving this community. There is a lot of descriptive work in the book, however Lunney and colleagues provide a robust koala habitat model that should serve Sydney's koala's well into the future, in addition to their righting the wrongs of historic species descriptions in showing that Bargo deserves its place on the map, if only for being where koalas were first recorded by Europeans. The history of the Inner West's new found long-nosed bandicoot *Perameles nasuta* population (Leary *et al.*) highlights the problems with listing endangered populations and state-based listings of species.

It would be remiss of me not to mention Harry Recher's view that Sydney's exotic fauna are an integral part of its biodiversity and should be retained in our management actions. Not surprisingly, this paper drove debate in the plenary session (chaired by Paul Willis) and certainly is against my view of prioritising conservation actions and numerous authors of chapters promoted resurrecting Sydney's biodiversity to some previous state, but it does raise the important point of what conservation benchmark are we aiming for — without goals, it is impossible to succeed. Nonetheless, while I sit in the "good native/bad exotic" camp, I agree with Recher's view that it is better to decide to do nothing, rather than doing something based on a guess or not being able to make a decision.

Will this book lead to any major advances in our ability to conserve biodiversity in Sydney? Perhaps the analyses of Hal Cogger and Schultz and Ransom will result in acceptance that large conservation areas are necessary to avoid the erosion of biodiversity. However while the Editors conclude by acknowledging the contribution of Sydney's great bordering national parks in allowing native biodiversity to persist, it is important to point out that, even in these bastions of conservation, numerous species are locally extinct. Many of the studies within this book may provide baseline to use in restoration attempts.

The book does suffer from some minor editing issues and some chapters cite works in a random fashion, but generally it is well written and edited. I have often felt that the RZS annual fora and the resulting books were something of an old boys' network with the same contributors year in, year out, presenting data-free papers. Having read this entire book, I have now altered this view. While many of the contributors have done so previously, their additions to this book are novel and highly interesting. Furthermore, the new and irregular contributors provide refreshing additions to our knowledge of Sydney's natural history and the RZS. I look forward to the next RZS publication.

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