BOOK REVIEWS

Temperate Woodland Conservation and Management

David Lindenmayer, Andrew Bennett and Richard Hobbs (eds.), 2010.
CSIRO Publishing.
ISBN (paperback) 9780643100374
RRP AUD$89.95

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As excellent as this book is, its title is something of a misnomer. Because the book contains 40 short chapters summarising the key findings and recommendations of many of Australia's leading woodland researchers and managers, the words "Principles of . . ." should precede the existing title. While the book provides readers with a very good understanding of the major issues to be addressed in conserving and managing woodland habitat, as well as in producing effective and much-needed government policy, further reading is required from each chapter's extensive list of references to obtain the detail of how to conserve and manage woodlands.

The biodiversity value of woodlands in southern Australia is significant, particularly for bird and bat conservation. Because woodland soils were suitable for agriculture, between 80 and 90% have been cleared (Thackway, Chapter 31). The remainder is subject to many serious threats including grazing, weeds, fertilizer drift, fragmentation effects and altered fire regimes. This book is a timely summary of relevant research, much of which has been carried out in the last 10 to 15 years.

The book was funded by a grant from Land and Water Australia, whose federal funding has now ceased. The decision to close this organisation highlights the often short-sighted nature of government decisions, while the book (with many of its chapters based upon research funded by Land and Water Australia) highlights the sometimes unexpected beneficial outcomes from funding.

Although the editors state that their initial concern about "substantial overlap and redundancy between chapters" was unfounded, it is the repetition of key conservation and management issues from several different authors which make this book so valuable: one author concluding that Noisy Miner numbers must be reduced could be dismissed as a personal view or an aberrant research finding; several authors coming to the same conclusion demands that the issue be fully addressed when managing a woodland remnant in eastern Australia, for example.

As the owner of a 103 hectare woodland/sandplain heath remnant in Western Australia, I found virtually all of the chapters to contain scientifically rigorous and practical (but not 'how to') findings, conclusions and insights into woodland conservation and management. The book's additional strength is that it allows a reader to delve as deeply as necessary into an issue of particular relevance to their patch of woodland via the extensive reference lists at the end of each chapter.

The book is not without its flaws. The few mistakes are minor: Streatfield *et al.* (Chapter 4) refer to bright and paler green colours in a black and white photo, for example. The use of the word 'restore' instead of revegetation, rehabilitation or repair as it applies to degraded environments is unfortunate, since it wrongly implies that woodland can be returned to its exact pre-disturbance quality within a reasonable timeframe.

More importantly, the book does contain some significant deficiencies, with three important issues only lightly addressed. The first is the use of artificial nest boxes. Many chapters emphasize the value of retaining old trees, including isolated paddock trees, because of nesting and roosting hollows that occur only in trees of reasonable age. Many other chapters reiterate the crucial need to revegetate degraded landscapes and woodland patches. However, no authors combine these two important issues together by stating that artificial nesting hollows can provide roosting and nesting sites during the 50 to 100 years that tree seedlings take to grow large enough to develop usable hollows. van der Ree (Chapter 18) refers to artificial hollows as a short-term solution and Lumsden and Bennett (Chapter 16) mention the need to retain dead hollow-bearing trees, but further consideration of this important issue was absent.

The second omission is a chapter on fire and its role in creating and maintaining woodlands in a healthy and diverse condition. Historian Sylvia Hallam (1979) researched reports and diaries of pre-European settlement explorers and early settlers to show that Aboriginal people used fire extensively to manage those parts of the landscape which provided them with useful resources or services. Only Gilfedder (Chapter 37) makes more than a passing reference to fire and she pleads for 'woodlands that are regularly burned, never burned, burned in all seasons, hot fires, cool burns, and so on'.

Thirdly, if woodlands grow on soils deemed valuable to post-European settlement farmers, then surely they must have been valuable to Aboriginal people as well. Unfortunately, no information is provided on Indigenous Australians' use of woodlands over tens of thousands of year; a pity, since current woodland managers could have gained many valuable insights from an understanding of such long-term practices.

Several authors refer to the serious problems posed by nutrients such as nitrogen and phosphorous entering woodland remnants from agricultural land and allowing weeds to dominate the understorey. The findings of wetland researchers are relevant here, since they have found that naturally occurring

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bacteria supplied with carbon will denitrify nitrogen and return it to the atmosphere. Conversely, phosphorous needs to be physically adsorbed by materials rich in iron or aluminium oxides, otherwise it will remain biologically available as organically bound P (such as the organic matter produced by weeds) which is seasonally recycled.

Gibbons (Chapter 3) believes that high quality or relatively unmodified woodlands should not receive the highest priority for conservation actions, with the focus instead being on moderate to poor quality remnants which are under greater threat. However, the best quality remnants also have the highest biodiversity and other values to lose if they are not adequately conserved and managed.

Overall, there is much to commend this publication. Owners and managers of woodlands, together with state and federal policy makers, will find it to be a source of many valuable and thought-provoking facts, conclusions and recommendations relevant to long-term woodland conservation and management. In particular, the emphasis placed on working with the private owners of woodlands should not be underestimated, since much of Australia's remaining woodlands exist off-reserve on private properties.

For two reasons, therefore, it is unfortunate that the various calls by several authors (e.g., McIntyre - Chapter 27) to return large areas of cleared farm land to woodlands rely so heavily on non-existent or poorly developed economic incentives such as carbon farming as discussed by Freudenberger (Chapter 34). Not only will such an outcome enhance the current rural depopulation caused by mechanisation and technological improvements to agriculture, but, if the fate of Australia's woodlands rests on a political decision to favour conservation over economic and social returns, then history suggests that the future of woodlands is bleak. Fortunately, in south west WA at least, many landowners are not waiting for government action, so the challenge for researchers and bushland managers is to actively and cooperatively work with private landowners to achieve mutual benefits.

For those doubting that woodlands can be repaired, several authors express their excitement at the presence of a huge area of high quality woodland in southern Western Australia known as the Great Western Woodland. In fact, this woodland provided some 30 million tonnes of timber to the early gold mining industry around Kalgoorlie around 100 years ago. The natural regeneration of large areas of this extensively clear-felled woodland suggests that, through research and commitment, major gains in conserving and managing Australia's remaining woodlands can be readily achievable.

REFERENCE

Hallam, S. (1979). Fire and Hearth — a study of Aboriginal usage and European usurpation in south-western Australia. Australian Institute of Aboriginal Studies, Canberra.

Culture, Ecology and Economy of Fire Management in Northern Australian Savannas –Rekindling the Wurrk Tradition

Jeremy Russell-Smith, Peter Whitehead and Peter Cooke (Editors).
CSIRO Publishing, 150 Oxford Street, Collingwood, Victoria, Australia.
Pp. 404 + x, ISBN 9780643094024 (pbk)
Price: Aud$99.95

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THE management system that this book describes — Western Arnhem Land Fire Abatement (WALFA) — is run by scientists and anthropologists, is informed by a vigorous research agenda and is aimed at empowering Indigenous management of the northern savannas by re-establishing a dialogue of traditional Indigenous fire management. The program might be best described as a hybrid fire experiment/management operation which seeks to provide worthwhile employment for traditional owners by generating income through emission trading, carbon storage, ecosystem services and biodiversity conservation. It is hoped that the process will combat Indigenous disadvantage and at the same time allow the re-establishment and enhancement of people's connections to country. In my opinion, the key to the success of this innovative, transdisciplinary program is the willingness of the researchers (scientific, social and policy) to integrate the research process with management. It is perhaps only possible to make this happen without a crippling bureaucratic burden in the remote regions of Australia, but nonetheless hearty congratulations are due for their successes. The publication is a great legacy for the resilience and commitment required over many years to reach this stage.

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The WALFA approach to fire management throws up a number of interesting issues, the most salient of which is the prioritisation of human (Indigenous traditional owners) needs above those of conservation. The last chapter, authored by the book's editors, points to this issue — "...in mature managed systems it is possible that biodiversity decrements will be encountered at some point..." (p. 384), and — "Optimal balance between [greenhouse gas] benefits and biodiversity may vary among ecosystem types" (p.385).

Not that there's any grounds for conservationists to be outraged by this approach. Though most Australian fire agencies and land managers claim that their fire management is 'ecological', this relies on the fallacious contention that small, low intensity fires of high frequency are good for biodiversity. Very little of Australia's landscape is actually subject to evidence-based ecological fire management. Therefore that conservationists might expect socially disadvantaged Aboriginal traditional owners to prioritise the management of their major asset for an essentially non-economic purpose when a revenue-earning alternative exists is unreasonable. The key point here is that the commonly-held assumption of urban Australians, that traditional Aboriginal fire management will somehow benefit all organisms does not bear close examination. A fire regime that may benefit one species invariably disadvantages another (Whelan 1995).

But that is not to say that this program ignores conservation. On the contrary, considerable energy has been invested in fire ecology and in my opinion, the program is better in this sense than most other landscape-scale programs in Australia (Chapters 7-10). My favourite chapter, (Ecological thresholds and the status of fire sensitive vegetation in western Arnhem Land, northern Australia: implications for management; Edwards and Russell-Smith 2009), is an excellent demonstration of how the limited fire ecology research resource can be directed to maximising landscape-scale inference and interpreted to provide a set of practical management guidelines based on current knowledge. The guidelines can be used to evaluate the program and in turn provide a basis for inferring affects on other species. Traditional owners might be interested in having more emus and bustards to eat; conservationists might want to stump up the cash to find out if there are more quolls or Gouldian finches. My expectation is that plant diversity is likely to be well catered for by this program but I'm sceptical that threatened vertebrates will be significantly advantaged without further special attention (Caughley and Gunn 1996). Conservation managers might want to pay for some of that attention.

Another important issue that the book throws up is the contrast between this program and other programs that purport to mimic Indigenous fire regimes usually to justify fuel reduction burning. The issue is a great big can of worms. There is no dispute that fire was a very important tool of traditional Aborigines and it was used for hundreds of purposes (Bowman 1998). However, there are very few data about the intensity, seasonality, frequency or type (i.e. the regime; Gill 1975) of fires lit by Aborigines prior to the arrival of whitefellas (Horton 1982). The landscape effects of traditional fire management – i.e. the burn pattern, time-since-fire pattern, fire-interval pattern and inter-ecosystem pattern are equally poorly known (Gill 1977). In addition data about how the fires lit by Aborigines interacted with fires caused by non-anthropogenic ignitions are just as scant. "Fire-stick farming" (Jones 1969) is essentially a poetic concept born of whitefella imagination. The idea that Aborigines 'tamed' or 'controlled' fire by maintaining the continent in a permanently fuel-reduced state through a systematic program of frequent, fine-scale, low-intensity fires goes far beyond any of the evidence — ecological, ethnographic or ethnohistorical — that we have (Bowman 1998). I can hear the social scientists sharpening their knives as I write, but eloquent prose, seductive anecdote and cogent polemic (Gammage 2008) are not data. The energy and effort required to maintain the continent in such a state is monumental and to what purpose? Certainly parts of the landscape that could support relatively high densities may have been maintained like a garden, but what happened when the landscape and human population changed (e.g. Chapter 3) and what happened when above-average rainfall caused rapid accumulation of fuel (Allan and Southgate 2002)? The assumption that small, low-frequency fires mimic Aboriginal burning and that this is good for biodiversity is a get out of jail free card for lazy land management policy makers and fire agency personnel seeking to justify what they just love to do; that is light fires.

The WALFA program is in another league entirely. The program sets out to burn a relatively large proportion of the landscape (in fact, the more burnt the better in terms of income) using helicopter delivered aerial incendiaries directed by traditional owners. This phase of the program is conducted in the early dry season when fire intensity is usually relatively low, the canopy is rarely burnt and fires are likely to self-extinguish overnight. The work achieves a variety of aims: 1) reduces the likelihood that intense, fast-moving fires will spread into Western Arnhem Land from elsewhere; 2) contains fires lit by traditional owners later in the year for cultural and economic purposes; 3) reduces greenhouse gas emissions from fires compared to what would be emitted if the same place was burnt by a canopy fire later in the year; and 4) promotes storage of carbon in woody biomass by reducing the number of woody plants killed if the same place was burnt in a more intense fire later in the year. The second phase of the operation is conducted by vehicle based traditional owners reducing fuel around cultural assets, hunting or preparing the landscape for hunting like the fire-drive described in Chapter 6 and burning areas that were too wet to burn during the initial operation, such as wetlands. The key to maintaining the operation is the production of a carbon credit — the difference in emissions between savanna that is burnt in the early dry season and that which is burnt in the late dry season when the fuel load is higher and the canopy is often consumed. It is on this basis that it is hoped that the program may be rolled out right across the Top End and that, it seems to me, would be a good thing.

The last point that I would like to make is that although some of the architects of the WALFA program describe it as the re-establishment of traditional fire regimes in Arnhem Land, I disagree. As the book says, Arnhem Landers live in outstations and towns, the burning is conducted from helicopter and Toyota, and the main aim is to produce a greenhouse gas emissions credit that can be sold in carbon markets. What this program actually does is re-establish the tradition of Aboriginal fire management in Arnhem Land. Who cares how Aborigines used to manage fire? The conditions in which traditional Aboriginal fire management developed no longer exist and it doesn't appear to produce very much that anyone wants to buy. What matters most is that Aboriginal disadvantage is addressed. What matters for conservation is how fire is managed tomorrow, next year and the year after that. What this program does is support the people of Arnhem Land in using fire to enhance their livelihoods and this, in my opinion, is exactly the way that Aboriginal people have traditionally used fire.

REFERENCES

Allan G. E., Southgate R. I. (2002) Fire regimes in the spinifex landscapes of Australia. In 'Flammable Australia: the fire regimes and biodiversity of a continent'. (Eds RA Bradstock, JE Williams and AM Gill). (Cambridge University Press: Cambridge)

Bowman D. M. J. S. (1998) Tansley Review No. 101 — The impact of Aboriginal landscape burning on the Australian biota. *New Phytologist* **140**: 385–410.

Caughley G., Gunn A. (1996) 'Conservation biology in theory and practice.' (Blackwell Science: Cambridge, Massachusetts)

Edwards A., Russell-Smith J. (2009) Ecological thresholds and the status of fire-sensitive vegetation in western Arnhem Land, northern Australia: implications for management. *International Journal of Wildland Fire* **18**: 127–146.

Gammage W. (2008) Plain facts: Tasmania under Aboriginal management. *Landscape Research* **33**: 241–254.

Gill A. M. (1975) Fire and the Australian flora. *Australian Forestry* **38**: 5–30.

Gill A. M. (1977) Management of fire-prone vegetation for plant species conservation in Australia. *Search* **8**: 20–26.

Horton D. R. (1982) Aborigines, fire and Australian ecosystems. *Mankind* **13**: 237–251.

Jones R. (1969) Fire-stick farming. *Australian Natural History* **16**: 224–228.

Whelan R. J. (1995) 'The ecology of fire.' (Cambridge University Press: Cambridge)

Desert Channels — The Impulse to Conserve

Libby Robin, Chris Dickman and Mandy Martin (Editors) (2010)
CSIRO Publishing, 150 Oxford Street, Collingwood, Victoria, Australia.
Pp. 330 + xxii,
ISBN: 9780643097490 (hardcover)
Price: Aud$59.95

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AUSTRALIANS have pretty much all the science we need to conserve our landscapes, what lacks is the will and motivation to make it happen. This book challenges the assumption of many conservationists that science is, or should be the primary consideration in land management. Instead conservation is presented as a value — an impulse. Science is a key facet but no more important than the culture, history, economy or social context of the people and the place.

Reading a bit like an extended National Geographic article, the book is presented in four parts entitled "Place", "Landscape", "Biodiversity" and "Livelihood". Between each part is an artistic interlude of illustrations and within each chapter are standalone sidebars, captioned images and a soundtrack — the collective work of almost 50 contributors from diverse backgrounds and varying interests. The academic imperative to reference has been retained, but not in the heavy-handed scientific style. Each piece has a feeling of individuality; "this is where I come from, this is my experience, this is what I have learned and this is what I think." Scientists are well represented amongst the contributors, but the scientific method is afforded no special prominence. The book is a collection of stories by self-professed conservationists — historians, biologists, painters, pastoralists, activists, palaeontologists, sociologists, traditional owners, photographers, students, agronomists, anthropologists, journalists, poets, public servants, archaeologists and more.

Part 1 is about the place, the channel country of south-west Queensland. A great expanse of arid country, sporadically watered by tropical rain flowing south down the braided channels of four unregulated rivers, the Georgina, Diamantina, Thomson and Barcoo. This part is heavy with history both white and Indigenous. One chapter focuses on the life of Alice Duncan-Kemp who was born in the region in 1901 and wrote about Aboriginal life, pioneering pastoralism, the plants and animals. Another chapter

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focuses on pituri, a narcotic derived from the plant *Duboisia hopwoodii*. High quality pituri grows in the sand-dune country in the north-eastern Simpson Desert and this fostered a trade network that encompassed 500,000km^2 from the Flinders Ranges to Cloncurry. Pituri also featured in a work of fiction, The Black Police, written by Arthur James Vogan following his Royal Geographic Society sponsored trip to the region in 1890. Both Kemp and Vogan are sympathetic to Aboriginal people, so their observations, language and attitudes are fascinating food for reflection. The other major contribution to place is from the Emmotts, a fourth-generation white pastoral family who run Noonbah Station a 52,000ha property near Longreach. The piece describes the connection to country of this family through droughts and floods and their skilful management for livelihood and conservation.

Parts 2 and 3 are written by scientists (mostly ecologists) and are in the scientific tradition of conservation. Part 2 is about the 'Landscape' and it contains one of our favourite pages in the book, four aerial photos of the Channel Country in flood. The small red sand-dune islands surrounded by braided drainage lines, suggest a desert being gradually washed away by the rare but inexorable floods. The photos underline the dominating effect of water in the landscape despite its scarcity. Part 3 is called "Biodiversity". The choice of the title is interesting since the chapters are mostly about vertebrates and dinosaurs while the chapters in part 2 are about plants, invertebrates and fish. The relationship of the title to the content is inconsequential except perhaps to suggest that the separation of life from landscape is artificial. The two parts thoroughly describe the Channel Country from the vegetation patterns and the forces that shape them, the insects, river systems, artesian springs, animals and even the dinosaurs.

Part 4 — "Livelihood" takes another tack. This part focuses on people, their attitudes and connections to the land, their needs and their choices. Of the four authors only one is a scientist and even then his topic is social. Of the other three, two are historians and one is a pastoralist. "Livelihoods" places conservation in a social context and this differs from the scientific context in two ways, 1) It treats people and our activities as part of the landscape, accepts that we have needs, but also takes advantage of our capacity to work, and 2) It redefines conservation by de-prioritising technical aspects such as landscape process and ecosystem function, and recognizes it as a personal value — a choice or an impulse. Good science may produce good information but whether or not that information deserves attention or action is the right of every individual to decide and the decision that individuals reach is integrated with their personal circumstances and their social context. Livelihoods shows how people in different situations — remote and regional Australians, Indigenous people and agricultural producers have different concepts of conservation than those of the urban-dwelling mainstream movement. Clearly, while the hunting of Bustards is unlikely to assist their conservation (Garnett and Crowley, 2000) and cattle-grazing in the arid zone often suppresses populations of native species (James *et al*. 1999), these activities produce resources which people need while at the same time finding some sort of balance with nature. While this balance may be imperfect (i.e. extirpate some native species) it is arguably better in a conservation sense than activities that completely remove the ecosystem such as the construction of new Canberra suburbs on threatened Yellow Box grassy-woodland or the mining of bauxite under *Eucalyptus tetradonta* woodland on Cape York.

In our opinion the key message in this book is to challenge the preferences – dare we say prejudices - of the mainstream conservation movement in Australia. The model of conservation centred around protected areas implicitly seeks to return Australian landscapes to a pre-European condition by retaining or re-establishing those conditions. Aboriginal people have a place in these systems but whitefellas and the "feral" species that came with us do not. Unfortunately this approach to conservation is flawed because Australian landscapes have changed since Europeans arrived and continue to do so. In our work surveying proposed and newly-gazetted protected areas in NSW, it is not unusual to see threatened birds such as Diamond Firetails, Southern Whitefaces, Hooded Robins and Superb Parrots in the paddocks as you follow the farm track up the valley towards a patch of remnant vegetation on the hilltop. Our observations suggest that conservation of these species may be better achieved in a less-than-pristine agricultural landscape than it is in many of the about-to-be-gazetted remnants — though it is important to add that the remnants are better than paddocks for many other species especially reptiles. In one instance we saw threatened birds sharing a paddock that the landholder had turned into a dirt bike track with a group of riders as they blatted around. Then in the morning when the group went out shooting kangaroos and pigs, the birds remained in the paddock apparently unconcerned. The point is that some of the preferences (dare we say prejudices) of those of us who have championed conservation exclude motorbikes and shooting, thereby excluding the Australians who enjoy these pursuits without clearly demonstrating why these pursuits are incompatible with conservation aims. In our view, the human-centred landscape approach to conservation that Desert Channels demonstrates may be more effective than an approach that is entirely focused on reserves, but it can only happen if we in the mainstream loosen up a bit.

REFERENCES

Garnett, S. T., and G. M. Crowley 2000. *The Action Plan for Australian Birds*. Environment Australia, Canberra.

James, C. D., Landsberg, J., Morton, S. R. 1999. Provision of watering points in the Australian arid zone: a review of effects on biota. *Journal of Arid Environments*, **41:** 87–121.