

## Book review

### Conserving Forest Biodiversity: A Comprehensive Multiscaled Approach

David Lindenmayer and Jerry Franklin

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This new publication from David Lindenmayer and Jerry Franklin has a rather ambitious title, and almost achieves its promise. It undoubtedly would have got even closer if it had been called 'Conserving *Temperate* Forest Biodiversity'. The authors acknowledge that the bulk of their experience lies within temperate latitudes, and take the view that the general themes and principles have application in other landscapes. In truth, the tropics deserve another book. However, this is a well-written, interesting and informative book for the temperate regions and will be widely used, particularly in university courses. Its excellent use of examples and case studies has great appeal.

The authors argue that 'the matrix' — that is the forest outside the reserve system — matters if society is to be successful in maintaining forest biodiversity. They make it clear that their objectives are to make the critical role of the matrix more apparent to stakeholders and decision-makers, and to suggest approaches for its sustained management. They seek to stimulate readers to identify the best strategies to achieve conservation objectives in particular stands and landscapes.

The book consists of four parts, each containing several logically linked chapters. Part I comprises four chapters that outline general themes and principles for developing comprehensive plans for conserving forest biodiversity through matrix management. Although the definition of matrix could have included all lands with an influence on biodiversity, this section is very effective in describing the critical role the matrix plays in biodiversity conservation, and in exploring its importance in key areas of ecology.

The book's appeal would be broadened by a chapter on biodiversity and its measurement — or at least a guide to the recommended readings for particular components. Biodiversity could be considered in the context of climate, historical and ecological biogeography, and landscape pattern and process to allow global patterns of biodiversity to be discussed in relation to forests. This would allow issues of congruence between different components of biodiversity, and the trade-offs between productivity and other ecosystem services to be addressed more effectively in later chapters.

The authors provide a useful perspective on natural disturbance regimes in forests, well supported by excellent diagrams. While the historical or natural range of variability is provided as a potential guide for determining appropriate management actions, a wider viewpoint involving different time-scales (geological, ecological and political) would enhance this section. After all,

the recently rejuvenated landscapes (due to glaciation) of much of the Northern Hemisphere differ fundamentally from many Southern Hemisphere landscapes. The implications of these differences for the conservation of forest biodiversity are not well understood; nor are they explored in this book. Thus, greater discussion of disturbance in relation to relict taxa and refugial habitats — an important emerging theme in the Southern Hemisphere — would help to draw attention to the rather different environments characteristic of the different hemispheres.

Part II presents the elements of a comprehensive approach to the conservation of forest biodiversity, including reserves management, applied in both near-natural forests and plantations at multiple spatial and temporal scales. This part is again well presented with excellent use of supporting diagrams and examples. I would have liked to see more discussion of ecosystem management through the *integration* of the other environments that characterise many forested ecosystems. This particular section would benefit from example maps (perhaps based on landform soils patterns in different landscapes) showing the way various features can occur in relation to one another in a variety of forested ecosystems.

Examples of the use of stream buffers in forest plans from Australia would complement those provided from North America. As a tool for the conservation of biodiversity, silviculture is not given quite the prominence it deserves and the discussion on patch sizes is somewhat superficial. In addition, the conservation of biodiversity in degraded cut-over stands, and the role of silviculture in rehabilitation, deserve more attention.

The limited coverage of biodiversity and plantations is disappointing (although the Tumut example is a welcome inclusion), and a more positive quote could have been provided at the start of Chapter 10. There are some great examples from the hoop pine plantations of Queensland that would add to this chapter. In fact, the hoop pine story would make a very good case study as it illustrates important issues in the trade-offs between forest plantation management and biodiversity conservation.

Part III consists of five case studies illustrating applied matrix management in forests. It illustrates the need for multi-scaled strategies as part of a comprehensive approach to biodiversity conservation. These case studies cover conservation planning and matrix management issues from North America (yes, the spotted owl example), South America (from the Amazon Basin and Tierra Del Fuego) and Australia (yes, Leadbeaters possum from the

mountain ash forests of Victoria; and the Tumut Fragmentation Project). The case study from the Amazon basin is anomalous environmentally, but is relevant to the theme, being the famous SLOSS experiment. The Rio Condor Project provides an interesting new perspective on industrial-scale forestry with limited involvement by local people ('largely extirpated'). The picture seems a rosy one, but few landscapes on the planet are devoid of any sign of interest by local people — this will be an interesting project to follow from the social perspective.

The geographic bias of the book is emphasised by its omission of African literature and of case studies from Europe or Africa. Some additional balance would have been provided by including a well-documented African case study — that of Knysna Forest is a fine example — and at least one European example (perhaps the ancient oak plantations of France). Nevertheless, the authors give examples that range from relatively intact forest ecosystems to intensively managed plantations. The case study concept works well, serving to illustrate the multifarious variety of landscapes, stands and contexts for the conservation of forest biodiversity, and justifying the avoidance of 'recipes'.

Part IV covers additional aspects of matrix management in forest landscapes, such as the role of adaptive management and monitoring, refinement of matrix management, social dimensions and tensions in implementing matrix-based forest management. This section is important and well researched, but could have been much longer. As the authors acknowledge, this is where the real problems for biodiversity conservation lie: the trade-offs, the social dimensions, and the tensions between the different sectors of society and their perceptions of forests.

The authors argue that ecologically sustainable forest management (to which they subscribe) involves more than the conservation of biodiversity. For example, they recognise the importance of the matrix in providing goods and services. However, they argue that to address these issues would require a larger book. Actually, many in forest management would expect to see the interactions between production of goods and services and biodiversity conservation covered in a book of this kind. In particular, the issue of trade-offs between biodiversity components and other components is not referred to. It is likely to be these interactions that decide whether or not biodiversity conservation will be achieved in relation to forest use.

The chapter on adaptive management and long-term monitoring is informative but could be improved by a substantial section on inventory as it relates to biodiversity assessment and timber yields. Much of the difficulty with forest management at the present time relates to trust by stakeholders and the general availability (or otherwise) of reliable inventory data to underpin discussions about sustained yield and commitments to biodiversity. Timber supply commitments can have a major influence on what is possible for biodiversity conservation in any particular spatial or temporal framework.

The authors draw attention to intensifying exploitation of the matrix, when considering the broader area of wood production, and wonder whether it would have been better to improve matrix

management practices rather than expand the reserve system (during the Regional Forests Agreement process). Nevertheless, adopting matrix-based management without appropriately adjusting timber harvest levels can result in simply shifting ecological impacts of harvesting from one part of the landscape to another. Many (including the authors) have argued that wood production levels must reflect the productive capacity of the land base under a selected management regime and cannot be stipulated *a priori*. As the authors contend, matrix-based management results in a reduction of timber yields, at least in the short run, for many reasons.

There is some healthy debate in the scientific literature concerning what is reliable knowledge and how this knowledge can be applied. The authors are to be commended for presenting alternative perspectives on broadscale national and state policy issues such as SLOSS, approaches to monitoring programs, and allocation or integration in forest management. However, they could have paid greater attention to the on-going debate about local-scale issues. The authors contend that there may be mounting public confusion about what constitutes reliable knowledge, leading to mistrust of the scientific community. The debate about this, and about how agencies use information concerning biodiversity, is a key issue for the future. There is more than one paradigm operating with respect to biodiversity conservation in forests, and these paradigms include differences in philosophy, scale, culture, discourse and power relations.

Remote sensing, GIS and other landscape-oriented tools are hardly mentioned in the book though they have been a major component of biodiversity assessment for many years. While such tools are not necessarily particularly helpful without ground-based validation, they can be important for broadscale planning. When used in conjunction with ground-based surveys they are invaluable for biodiversity planning and management. The book's discussion of the role such tools can play could be considerably expanded.

A couple of small technical errors were noted: *Phytophthora cinnamomi* is taxonomically not classified as a fungus, being in the Kingdom Protista. Hence the term 'pathogen' would be more appropriately used to describe it. Aboriginal people when described as a group need a capital A, even though they consist of many cultures and groups, because they are a recognised entity. Relatively few spelling, grammatical and factual errors were noted, although a few of my colleagues' names are misspelt.

There is good use of diagrams and figures throughout the book despite the North-American bias (e.g. of the 20 landscape photos in Part I, all but four are North American, and there is a regular appearance of conifer silhouettes). In spite of its minor deficiencies, this book should be read. It is a welcome addition to the reference texts on biodiversity and forest management, and an excellent first edition with which I will be delighted to encourage my students to engage. Meanwhile, the tropics await their own book on the subject.

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