

The long-term sustainability of the marine environment is dependant on the establishment of Marine Protected Areas (MPAs) which can fulfil such objectives as protecting biodiversity and ecological integrity, acting as replenishment sources for fish, providing monitoring sites, managing for cumulative impacts, and preserving genetic diversity.

This book has succeeded in detailing stepwise procedures that are appropriate for the entire MPA

process and will be an invaluable resource for managers at any stage of the MPA process. It is comprehensive in covering all the hurdles that may be encountered from the planning stage through to implementation and management. Hopefully, it will encourage conservation and sustainable use of the marine environment, which in turn will heighten public awareness of the importance of these regions.

A comparative review of Australian Conservation Biology texts

Conservation Biology for the Australian Environment.

M. A. Burgman and D. B. Lindenmayer, 1998.
Surrey Beatty & Sons, Chipping Norton, NSW, Australia.

380 + x pp. 16 Chapters.
ISBN 0 949324 78 7.

Conservation Biology: an Introduction for Southern Australia.

T. R. New, 2000.
Oxford University Press, South Melbourne, Victoria, Australia.

422 + xviii pp. 13 Chapters.
ISBN 0 19 550715 0.

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CONSERVATION Biology is an amalgamation of a number of scientific and social sciences, that has resulted from an increased awareness of the need to protect living organisms and the ecosystems that support them. This new discipline "... provides the intellectual and technical tools that will anticipate, prevent, minimize and/or repair ecological damage ..." (New 2000, p2) resulting from anthropogenic activities.

Publications dealing exclusively with conservation biology are not yet as numerous as texts related to the applied sciences, and those that do exist are chiefly produced in the Northern Hemisphere. In answer to the prayers of Australian students and researchers, two books, focused on the country's unique environments and biota, have been recently published. Burgman and Lindenmayer's text, *Conservation Biology for the Australian Environment* ("B&L"), published in 1998, was previously reviewed in this publication (Agocs *et al.* 1999). New's book, *Conservation Biology: an Introduction for Southern Australia*, published in 2000, is critiqued in this review, which also provides comparisons of content, focus and style between the texts, allowing readers to decide which may better suit their needs.

The books present a diverse array of material covering aspects of Australian conservation biology issues. However, where "B&L" focuses on the principles of conservation biology and the main quantitative methods and procedures, "New" also examines the requirements

of the conservation biologist, discussing current political and management options and the limitations of research literature and scientific methods.

"B&L" is divided into four sections. Part I, *Principles for Conservation*, presents the how, what and why of conservation biology, introducing some fundamentals of the discipline including species diversity and richness, endemism and genetic diversity. *Impacts*, Part II, discusses changes to the natural environment as a result of human activities. Part III, *Methods of Analysis*, explores analytical tools, which can be used to solve conservation problems. *Management Principles for Conservation*, Part IV, is a single chapter that places these tools into a management context (Agocs *et al.* 1999).

"New" is comprised of 13 chapters. The first five chapters define and explore some of the central themes of conservation biology. Highlighted are the need for this science in Australia (chapter 2), and how and why this country has the unenviable position of having one of the highest extinction rates in the world (chapter 3). Chapter 4 deals with how conservationists look at biodiversity, defining various levels of diversity and species richness and introducing the forms of information available for use in decision making. The evaluation of species' conservation status is discussed in Chapter 5.

The next three chapters focus on the practical and theoretical levels of conservation biology. Chapter 6 discusses management at the species level, indicating that, as conservation is expensive and time consuming, priority is accorded to species deemed as most important. Conservation through habitat protection is introduced in Chapter 7. It covers the design, selection and management of reserves for the short and long term, recognizing the need to plan for future problems such as climatic variation. Chapter 8 also looks at conservation beyond the current reserve system, exploring possibilities such as agricultural and private lands as biological safe havens and the restoration of degraded land.

A full host of threats and their consequences to native species are discussed in Chapters 9 and 10. These range from habitat destruction, fire and invasive species to pollution, commercial exploitation and salinization. Threat management and abatement are also discussed. Chapter 11 explores conservation in captivity and problems associated with maintaining a captive-breeding

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programme, including effective population size, domestication, genetics and reintroductions. Chapter 12 provides an overview of some cases in species conservation, including the koala and kangaroo as well as less controversial species. In the last chapter of the book, "New" addresses the regulatory framework for conservation biology, focusing on Australia's national legislative framework and our international obligations.

The writing style of the texts is suited to undergraduate students. "New" assumes little prior scientific knowledge in the explanations of ecological concepts and principles. The language is succinct, yet includes enough detail to meet the needs of the beginning undergraduate. Complex terms that arise through the text are emphasized in bold print and defined in the glossary. The language used by "B&L" explains ecological concepts in more detail and is better suited to the advanced undergraduate.

Neither text discusses the basic principles of community or population ecology. Therefore, we feel that either a previous background in ecology and biology, or concurrent study of these subjects with conservation biology, would be advantageous for the reader.

Although the writing style of "B&L" is comprehensible, some of the concepts may exceed the scope of beginning undergraduates, assuming prior knowledge of Mendelian genetics and introductory statistics. The section dedicated to data analysis, for example, lacks practical examples of how and where to apply them to conservation biology. In comparison, "New" does not address analytical methods, failing to discuss the application of mathematical theory altogether. "B&L" also incorporate molecular ecology, such as DNA sequencing, into the discussion of genetic variation. This involves the explanation of complex biological terms and requires prior biological knowledge. New's discussion is less detailed, examining genetic diversity at an ecosystem scale by focusing on population size, isolation and fragmentation and their effect on biodiversity. This level of detail is all that is necessary, considering the role of both texts as conservation biology textbooks. We feel the complexity of some issues discussed in "B&L" may make this book better suited as a text in advanced conservation biology for undergraduates or as a reference text for postgraduates and researchers, while "New" would meet the requirements of introductory conservation biology units.

"New" and "B&L" each indicate their books are produced for an Australian readership, with New's text focused chiefly on southern states. Although this will be of great benefit to local students, many principles outlined in the texts, such as those related to reserve design, analytical tools and threat management can be adopted by similar audiences from other regions and countries. The fundamental principles of conservation biology are also applicable to non-terrestrial systems. For example, marine environments are not explicitly discussed in either text, yet habitat protection, experimental design, monitoring and many other concepts can be transferred from terrestrial to marine ecosystems with no more modification than would be required to move from rainforest to desert.

The references cited in the texts are mainly sourced from Australian literature, with non-Australian material often included as practical examples. "New" provides a list of further reading at the end of each chapter, a feature absent from "B&L". Although many works were referenced in both books, "B&L" lists twice as many references as "New". This is not necessarily an indictment on "New" as this book is not as detailed as "B&L". A similar situation exists in relation to the glossary. The stronger mathematical focus of "B&L" means it presents more technical definitions, whereas "New" concentrates on terms related to ecology and management, referring readers to biological dictionaries for more complex issues. It is interesting that with increasing world focus on sustainable development, neither text offers a definition of this concept. Definitions in "New" are generally easier to understand reiterating its suitability as an beginning undergraduate textbook.

New states that the "... sequence of topics is not prescriptive, and many readers will prefer to dip in anywhere". However, the index appears too brief for this purpose. In comparison, the "B&L" index is comprehensive, including tables and figures as well as an appendix listing the common and scientific names of all species mentioned in the text.

The books present a wealth of supplementary information in similarly structured tables, graphs and figures. "New" also uses plates (photos), often in a series, effectively supporting the adage that "each picture is worth a thousand words". "B&L" use boxes to present Australian examples, which relate to the associated text. Although referring to specific cases in the body of the text, New does not use the box format, instead dedicating an entire chapter to case studies. We feel a combination of "B&L's" boxes and "New's" plates would provide the perfect compliment to standard graphs, tables and figures.

Despite both texts adequately covering biological conservation theories and applications, neither provides a critique of the legislative framework in which conservation biology operates. One consolation to this is that "New" addresses regulations in terms of state and federal legislation, and international obligations resulting from conventions and treaties. In contrast, "B&L" fail to even outline the simplest of regulatory frameworks for conservation biology, let alone critique its success. We feel the books could actually be described as apolitical, as neither attempts to identify legislative shortcomings or to suggest possible changes, when we can be quite sure that the current legislative framework is far from perfect.

Although in its infancy, the need for conservation biology is undeniable as human activities continue to threaten the natural world and increasing numbers of species face uncertain futures. The New and Burgman and Lindenmayer texts provide fundamental tools required by students of environmental disciplines to appreciate and understand this new science. Hopefully this will empower them, in turn, to educate and influence policy makers to ensure conservation becomes more than an afterthought on political agendas.