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BOOK REVIEWS

Environmental Biology

Calver, M., Lymbery, A., McComb, J., and Bamford, M. (eds.) 2009,
Cambridge University Press, Melbourne
xv + 671 pp. ISBN 978-0-521-67982-4 paperback
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WILLIAM E. DAVIS, JR.¹

THIS is an introductory biology textbook that is tailored to the needs of students who will major or take courses in environmental science, conservation, sustainable development, or other areas that deal with anthropogenic problems of habitat degradation, extinction, and human over-population. It is an introductory text in that it presents all the paradigms of biology, including cell theory and evolution, as well as scientific method, field techniques, and problem solving, all with an environmental emphasis. Most of the focus of the numerous examples is on Australian subjects and problems. For example, three case studies presented in the introductory chapter deal with the conflict between timber production and the conservation of Leadbeater's Possum *Gymnobelideus leadbeateri*, whether humans caused the outbreak of Crown-of-thorns Starfish *Acanthaster planci* on Australian reefs, and the conservation of a rare plant species, Corrigin *Grevillea Grevillea scapigera*, after massive land clearing in Western Australia.

The book is organized around five themes: (1) what is environmental biology?, (2) scientific method

and the unifying theories of biology; two themes deal with applying scientific method: (3) understanding biodiversity, and (4) biodiversity and the environment, and last (5) the future—applying scientific method to conserving biodiversity and restoring degraded environments.

The five themes are divided into 27 chapters, each of which is further divided and subdivided with relevant headings that produce a coherent outline, supplemented by side-bars, in this book called “Boxes,” which provide relevant examples or supplemental information. For example, chapter four, “Cell theory II—cellular processes and the environment,” contains sections on “Uses and sources of energy for organisms,” “Photosynthesis,” “Respiration,” and “Energy flow in the environment.” The Photosynthesis section is further subdivided into “Landmarks in the study of photosynthesis,” “The structures and organelles for photosynthesis,” “Energy-trapping or light-dependent reactions,” “Light-independent reactions: synthesis of sugar in the Calvin cycle,” and “Fate of glucose,” with boxes that deal with: which wavelengths of light power photosynthesis; photorespiration; and increasing the efficiency of photosynthesis. Each chapter concludes with sections entitled “chapter summary,” “key terms,” “Test your knowledge,” “Thinking Scientifically,” “Debate with friends,” and “Further readings.” The chapters are illustrated by 218 figures and 31 tables, the figures including 65 black-and-

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white photographs. In addition there are four sections with a total of 56 colour plates containing 279 images. I found the line-drawing figures, particularly those 100+ by Belinda Cale, to be of great value. There is a strong historical dimension to much of the material that, in my opinion, contributes greatly to understanding environmental problems and what needs to be done in the future to try and mitigate anthropogenic effects on our ecosystems. The 34-page Glossary is excellent. The Index is adequate, but could have been more inclusive.

This book is the work of many people with a broad spectrum of professional specialties and interests. Twenty-nine contributed to the text and two provided the bulk of the illustrations. Although considered an introductory text, it could well be considered a

reference text for more advanced courses. I found the text of this book well organized and thorough, presenting the material and examples with an environmental focus. The book does not avoid sensitive cultural and political issues, presenting, for example, human population growth as a major concern, and placing the blame for the current high rate of extinctions and global warming on anthropogenic factors. Chapter 1, in the section "Chapter aims," opens with the statement: "This chapter describes how the success of the world's dominant animal species, humans, has severely altered biodiversity and natural ecosystems." This book would provide a firm foundation in biology for any student with environmental interests and a wake-up call to any not interested in environmental issues. I highly recommend this book.

Problem-Solving in Conservation Biology and Wildlife Management, 2nd edition

James P. Gibbs, Malcolm J Hunter Jr., and Eleanor J. Sterling (Eds), 2008
Blackwell Publishing, Malden, USA
xii + 332 pp. ISBN 978-1-4051-5287-7
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JARRAD A COUSIN¹

EFFECTIVE dialogue between scientists and policy makers has been identified time and time again as one of the most important factors limiting objective conservation outcomes (e.g., Sutherland *et al.*, 2006). Education is an important step in facilitating this dialogue, as all too often there appears to be a divide between the proponents of conservation biology (scientists, academics and students) and practitioners driving wildlife management (policy makers and politicians). *Problem-solving in Conservation Biology and Wildlife Management* represents a manual for the practical application of theoretical ideas and the means of communicating them, thus bridging the divide between theory and practice.

Problem-solving in Conservation Biology and Wildlife Management is divided into 32 chapters, themselves divided into 6 Parts. There is a nice logical progression through the Parts from Introduction, Genes, Populations, Species, Ecosystems and Landscapes, to Policy and Organizations. This book differs from most other publications in being designed specifically as a laboratory textbook; merging theory with practice through a problem-based learning approach.

The first three chapters outline and define biodiversity and the importance of conservation

biology; demonstrating these overarching themes through simple exercises. The four chapters in the Genes part of the book cover population genetics, genetic drift, pedigree management and landscape genetics; also all provided with practical examples. Parts 3 and 4 (Populations and Species respectively) cover diverse concepts from habitat loss and fragmentation, estimating population size (using DISTANCE, PRESENCE and MARK computer programmes) through to considerations in designing a zoo. All these chapters are accompanied with specific examples, such as an examination of the effect of El Niño frequency on penguin population persistence used to illustrate population viability analysis. Part 5 (Ecosystems and Landscapes) examines conservation biology challenges at greater spatial scales from an examination of the impact of forest harvesting on parrot species conservation, to the use of GIS mapping to guide recommendations for conservation reserve selection, to predictions of species geographical ranges through climate envelope modelling. The need for a synergistic interaction between the often disparate fields of conservation biology and wildlife management is demonstrated most strongly within Part 6 (Policy and Organizations). In these final seven chapters, cultural and sociological considerations are incorporated through practical exercises designed to examine how aspects of human society not only affect biodiversity, but people's attitudes toward biodiversity. The final chapter, entitled "Conservation Policy: Shaping your government", outlines the numerous ways that conservation biologists and wildlife managers can apply their knowledge in policy debates. It outlines effective ways to communicate from writing "letters to the editor" for newspapers, writing to elected

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