

Book Reviews

Raising the profile of natural history museums

Krupnick, Gary A. and Kress, W. John (Editors) 2005. *Plant Conservation. A Natural History Approach*. University of Chicago Press, Chicago, 344 pp. Paperback, ISBN: 0-226-45513-0, \$30USD, £21.

This book is undoubtedly intended to showcase the work that is being undertaken at one of the world's best known natural history museums, the National Museum of Natural History at the Smithsonian Institution, Washington DC, USA. The Preface makes it clear that "...The information contained is not an exhaustive treatment of the science of plant conservation. Rather, a diverse sampling of the conservation activities of botanists at museums and botanical gardens is provided as an introduction to the varied contributions to the field that natural history scientists are making." As such, the editors have indeed delivered an eclectic mix of contributions (not least Chapter 14 *Grassroots Conservation*), brought together into four Parts comprising 14 Chapters and a Conclusion with 30 high-quality colour plates, which explore plant diversity through the past and present (Chapters 1-3), in relation to aspects of some habitats and certain taxonomic groups (Ch. 4-5), and then the contemporary causes of plant extinctions (Ch. 6-9), ending with a section on the conservation of plant diversity (assessment, management strategies, and action) (Ch. 10-14). This is a large range of material to cover, and some chapters are more detailed than others.

Daniel Janzen provides an inspiring foreword. As he puts it, the editors "have herded a fine batch of botanical cats into a collective review of where the plant priesthood stands on the natural history of plant conservation." There is indeed much valuable information brought together in "*Plant Conservation*" and one hopes that it has achieved its main aim of raising awareness of the botanical work done in natural history museums. Maintaining some degree of cohesiveness from the 48 contributors (based in: USA (38; 26 at Smithsonian); Germany (4); United Kingdom (3); Venezuela (2); Brazil (1)) must have presented a challenge to the editors, given the range of interests of the contributors, and their varying approaches and styles. However, small introductory vignettes at the start of each Chapter usefully provide the reader with a generalised overview of the Chapter's intent. Within each chapter there are sections, written by different

authors: some as an overview of the particular topic, others as a much more personalised approach. There is some variation within and between chapters associated with differing authors' interpretations and conclusions but this is not necessarily a problem, if read in the broader context of scientific debate.

One of the book's strengths is the bringing together of conservation-related topics with plants as the focus. Let's face it: plants have a public relations problem when compared to the cute and cuddly. Further, when it comes to ecosystems, there is a lot more attention paid to terrestrial systems than aquatic ones. This book endeavours to deal with both issues. 'Plants' are interpreted broadly, and attempts are made to provide varied examples with case studies being taken from the marine and terrestrial environments. So the reader is informed, for example, about the global diversity of seaweeds with the expected diversities of regional red, brown and green algae being extrapolated from 'reasonably well described seaweed floras' which include the New Zealand work of Nancy Adams (Adams, 1994). Habitat fragmentation traverses the Brazilian rainforest, the Caribbean islands, Madagascar, coral reefs, and the kelp communities of the North Atlantic. Consequences associated with pollination, nonnative organisms, grazing, nutrient and sediment increases, and intensive fish extraction are all highlighted.

Sometimes the 'mix' does seem a little contrived but presumably this reflects the effort to involve as many Smithsonian botanists as possible. The editorial lead-in for Chapter 5 (case studies of select taxonomic groups), for example, states that '...Here we take a broad perspective [on the plant kingdom] to encompass most organisms that photosynthesise in some fashion...'. So follow, sections on Dinoflagellates (Phylum Dinoflagellata), Lichens (Phylum Ascomycota), mosses (Phylum Bryophyta), Grasses (Family Poaceae), Day Flowers (Family Commelinaceae), Acanthus (Family Acanthaceae), Daisies and Sunflowers (Family Asteraceae), African Violets (Family Gesneriaceae), and Litchis and Rambutans (Family Sapindaceae). The editors have emphasised the breadth of organisms involved, but the choices seem otherwise rather disparate.

It would seem that the various global initiatives to document biodiversity (e.g. Species 2000 <http://www.sp2000.org/>; All Species Foundation <http://www.all-species.org/>; Global Biodiversity Information Facility <http://www.gbif.org/>) were also a major motivation

for drawing together the contributors. But the one that really has Janzen excited, is the grand vision that one-day, not that far in the future, all life will be identifiable through DNA barcoding, with the creation of a portable device that links to biological databases allowing species identification. In fact, he is so excited that the reader is led to expect in-depth consideration of this approach in the book especially given that some think that the technology will galvanise taxonomy (e.g. Hebert *et al.* 2003), but others believe that if it is intended to replace normal taxonomy (for naming species) it 'is worse than bad, it is destructive' (Will *et al.* 2005). However, I did not get much sense of this debate in *Plant Conservation*, the differing views and practical solutions.

Funding is a perennial problem which *Plant Conservation* highlights but such critical issues as the decline in natural history teaching and training (Dickinson, 2005) and the demise of tertiary courses in taxonomy are only touched on. The current shifts, particularly towards molecular biology provide possibilities for new and innovative options but potentially at the expense of a solid grounding in field-based (rather than just lab-based) knowledge of organisms, their relationships and how they function in an ecological sense. I also did not get a sense of debate on some of the challenging ethical matters that face us today. For example, bioprospecting and gene patenting, particularly of plant material sourced from developing nations, are issues that are mentioned but not tackled to any great degree despite increasing concerns being expressed. On that point, there is some evidence of local involvement from the list of contributors but not a lot, particularly given the range of countries where the Smithsonian botanists have worked.

All this said, efforts to turn the spotlight onto plants and to raise their profile from books such as this one which bring the work of natural history museums more to the fore should be encouraged. I, for one, now have a much better idea of life at the Smithsonian. I would recommend this book mainly to advanced undergraduate and graduate students in the natural sciences, and those generally interested in diversity and evolution, as a useful overview.

References

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What's up belowground?

Bardgett, R.D. 2005. *The Biology of Soil: a Community and Ecosystem Approach*. Biology of Habitats series. Oxford University Press, Oxford, UK. 256 pp. Cloth, ISBN: 0-19-852502-8, £55.00, \$95USD; paper, ISBN: 0-19-852503-6, £24.99, \$45USD.

Soil biology and linkages between the above- and belowground components of ecosystems have received increasing attention in the ecological literature over the past decade. Although the role of soil biota in controlling ecosystem processes such as decomposition and regulating nutrient cycling has long been recognised, the role of soil organisms and belowground interactions in driving many community and ecosystem processes has only recently been appreciated by the wider ecological community. Richard Bardgett's book *The biology of soil: a community and ecosystem approach* is a timely, concise synthesis of this growing literature that serves as an excellent introduction and important resource for non-specialists.

The Biology of Soil contains six chapters that follow logically; first describing the physical and biological environment of soils, then reviewing the diversity of organisms found in soils, and finally demonstrating how belowground interactions control decomposition and nutrient cycling, which in turn have important implications aboveground. The remaining three chapters overview how soil communities drive ecological processes or interact aboveground biota including: feedbacks amongst soil organisms and plant species, the effects of herbivores and their interactions with the soil biota in different systems, and responses of soil biological properties to global change. Each chapter is clearly written, makes extensive use of the recent literature to highlight important findings or processes, and summarises succinctly our growing knowledge of the involvement of soil communities in ecosystems. A particular strength of this book is its clear explanations, illustrations and examples of the interdependence between the above- and below-ground components of ecosystems.

Even if you're not trained in soil biology (or normally find this area intimidating and give it a wide

birth), most ecologists will find this book approachable, highly readable, and an excellent review of our growing knowledge of soil ecology. This book is much more ecological than the title implies, and integrates above- and belowground ecological processes better than earlier volumes by Paul and Clark on *Soil Microbiology and Biochemistry*, or Coleman and Crossley on the *Fundamentals of Soil Ecology*. Because *The Biology of Soil* has such an ecological focus, it will appeal to a wide range of readers. For example, many topics including how belowground biodiversity influences ecosystem functions, how soil communities respond to global change, the role of soil biota in plant invasions, and the effects of herbivores on belowground processes should interest a general ecological readership. In addition, Bardgett makes extensive use of international literature and draws on examples from New Zealand, Sweden, Hawai'i, the UK and beyond to illustrate his points. This makes *The Biology of Soil* a particularly useful reference for practising ecologists, and also for use in senior undergraduate or graduate courses in general ecology, ecosystem ecology or soil biology.

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