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BOOK REVIEWS

Books on biodiversity and conservation

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Abstract Reviews and notices are provided on 62 books published over the years 2004–2012 which have been received by *Biodiversity and Conservation.* These are in the general areas of biodiversity, conservation, ecology, ethics, extinction, invasive species, methodology, and urban ecology. This is the third of a series of cumulative reviews and book notices, one or more instalments of which is included in the journal each year.

Keywords Bibliography · Ecology · Ethics · Evolution · Extinction · Invasive species · Methodology · Urban ecology

INTRODUCTION

Previous instalments of "Books on biodiversity and conservation" appeared in *Biological Conservation* 20(5): 1141–1154 (May 2011) and 20(12): 2845–2861 (November 2011). Information in this contribution concerns 62 books received by the journal which were published in the period 2004–2012. Reviews are included of 22 titles, and notices provided for a further 40 works. So many books appear in the fields covered by the journal that it is not practical to review all because of pressure on space, and that is why a back-log accumulated over recent years. With this instalment, the backlog has been cleared, apart from a selection of titles relating to agricultural biodiversity which will be the subject of a special feature, similar to that which dealt with works on insects and other invertebrates that appeared last year (20(13): 3279–3283, December 2011). Publishers wishing to have their titles considered for inclusion in the series should send them directly to me, as Editor-in-Chief, in the first instance. The reviews included are all to be attributed to me, unless otherwise indicated.

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GENERAL

What's so good about biodiversity?: a call for better reasoning about nature's value Donald S. Maier

Springer, Dordrecht, The Netherlands, 2012, vii + 568 pp, Price £153, ISBN 978-94-007-3990-1.

This is a very special book surely destined to become a pivotal work in the valuation of nature. The intent is "to challenge all of us environmentalists to reconsider and reground our arguments for why the natural world is valuable" (p. 3)—and it really does. That it is valuable might seem obvious to readers of *Biodiversity and Conservation*, but how many of us ever really thought this through? How often do we consider how soundly based such a statement is? And, as far as I am aware, it has never been subjected to such a detailed philosophical critique. With respect to biodiversity, the author considers that from "the range of arguments that defend and build upon its value, it is hard to avoid the impression of culturally conditioned, uncritical acceptance and unhealthy disciplinary inbreeding" where "circularity, confusions, missing premises, normative biases, and doubtful empirical claims go unnoted and uncorrected". It is not an easy read and there is much to challenge and refresh basic thinking on the value of biodiversity, raising issues of which practitioners should be aware when making cases or preparing statements to protect "biodiversity".

Following a discussion of an environmental philosophers' concept of values, the author identifies several "fallacies" pertinent to biodiversity debates, those of: "bare assertion", "accident", "correlation", "circularity", "modality or speculation posed as fact", and "equivocation". The chapter "What biodiversity is" seeks for a characterization of biodiversity that is sufficiently broad to include most conceptions, but strangely does not mention the introduction of the modern concept generally attributed to Norse & McManus's publication of 1980, nor the interpretation of biological diversity as defined in the 1992 Convention on Biological Diversity. Issues such as abundance, abiotic conditions, interactions, and place are argued to be "little to do with biodiversity". Further, he asserts that it is not wilderness, measures or indices, particular species or ecosystems, a process, charisma or symbolism, rarity or uniqueness. As to a calculus of values issues to be considered include various models from the incremental to the moral, Theories proposed on biodiversity value range from the moral to a resource (including of human food), service provider, human life sustainer, human health (including as a pharmacopoeia), "biophilia", and bioprospecting—and further to experiential value and as "natural order". This leads to "some inconvenient implications": value deflation from non-discrimination, nature as a science project, human interferences (assisted migrations, domestication, transgenic organisms, etc.), in situ versus *ex situ* conservation, human timeframes, omitting what is not considered biodiversity, and value post-mortem.

This critical philosophical analysis is a prelude to the author's attempt to develop a more robust concept of biodiversity and its value. He argues that this should have people as a starting point, but there are key issues to be addressed, including responsibility, confusion and disagreements on the end of the "biodiversity project", introducing bioengineering values, lesser-evil arguments, moral corruption—"gross, systematic, and widely condoned failures of reasoning" (p. 402). The reasoning failures identified include a blindness to unwanted implications, omitting or ignoring facts that are unpalatable, confusion over endpoints, pre-occupation with technology and modelling, a tolerance of or failure to challenge or critically evaluate, selective attention, distractions and delusions, conflicts of interest, institutional bias, and inertia. The concept of "ecosystem health" is debunked,

"proxy indicators" are questioned (p. 417), and the "precautionary principle" also gets short-shrift (p. 191).

The key question identified is a need to determine how biodiversity can best be integrated into human development and enterprise. This leads to his own theory of natural value based on "appropriate fit", which has as its core the basis for valuable human relationships with the natural world (p. 430), though he recognizes that this is also beset with difficulties and limitations. He stresses that "appropriate fit" is not anthropocentric, romantic, a resurrection of wilderness, biophilia, a protest against violations of the natural world, or about existence or intrinsic values, a part of environmental ethics, or respect for nature. There are implications for alien species, economic valuations, the conundrum of more and less biodiversity, valuing also abiotic components, historical changes, people in and outside cities, and issues of social policy and conservation. Maier acknowledges that much still needs to be worked out, and that his suggestion "remains a mostly abstract ideal" that is "a radical departure from conventional ways of viewing human relationships with the natural world" (p. 509). He is realistic in recognizing that his ideas are not likely to be widely shared and that resistance is to be expected from conflicts of interest and institutional momentum. Only time will tell, but all scientists involved in biodiversity research and teaching really should take time to question received ideas and concepts, whether or not they accept the theory propounded here. It will also be important for those having to operate in a court or political arena to consider points raised on which they may be challenged by alert barristers or counsels! He has dared to go where many would not question, and that is to be applauded even if all details cannot be endorsed or are not yet fully worked through. Sadly, to many this will be a very difficult read, as well as an expensive one, and I do hope that the author will prepare a digest for a widely available journal before too long to make his basic tenets more accessible for debate by a wider range of biodiversity scientists and environmentalists.

Biodiversity and extinction
John C. Avise, Stephen P. Hubbell & Francisco J. Ayala (eds)
National Academies Press, Washington DC, USA, 2008, xvii + 414 pp, Price US $59, ISBN 978-0-1309-12743-1.

This is the second volume in the *Light of Evolution* series, based on an Arthur M. Sackler colloquium, and designed to promote the evolutionary sciences. The first volume appeared in 2006 under the title *Adaptation and Complex Design.* The issue of species becoming extinct as a part of the evolutionary process of natural selection, is one with which conservationists are often challenged. This volume has contributions examining not only extinctions that have occurred in historic times, and currently declining species and communities, but further examples of what may be learned from the fossil record. Collectively, they provide many illustrative examples, but vary in the degree of specialism of the groups or communities addressed.

With respect to contemporary patterns in animals, the first paper focuses on the oceans, and effects such as over-exploitation, sea-floor damage by trawling, pollution, eutrophication, and damage to reefs. Amphibian decline is addressed by Wake and Vredenburgh who present evidence for a Sixth Extinction being underway, with over 200 species declining and endangered as a result of a disease caused by a chytrid fungus. The worrying situation of Indo-western Pacific reefs receives particular attention, and I found the account by Andy Dobson and colleagues on parasitic helminths of especial note; they estimate global numbers at 75–300 K and suggest that 3–5 % are under threat of extinction in the next 50–100 years. The issue of associated organisms being at risk, when their hosts

become extinct, is too often forgotten in biodiversity debates. As regards plants, the issue of invasions and extinction of native species on islands is considered, and notes that invasives can become naturalized. In the case of trees in the Amazon, neutral theory is used to predict that 5,000 species are likely to suffer a 50 % extinction rate, those with small ranges or sizes being most at risk. There are two contributions on microbes, which only consider prokaryotes; one concerns differences from patterns in plant communities with increasing altitude which is hardly surprising, and the other the thorny questions of resistance, resilience and redundancy; it is argued that it is the most sensitive and not immediately resistant that may have the most potential to affect ecosystems, and recognized that these cannot readily be incorporated into models.

The fossil record suggests that only 1–2 % of the species that exist today have been present over the last 600 Myr, and Erwin considers the different metrics used to assess biodiversity loss. Extinctions and spatial dynamics are addressed by Jablonski, and in the case of marine communities, Alroy estimates that it will take at least 10 Myr, and possibly 40 Myr for them to recover from the current mass extinction. Some extinction events have been relatively recent, and in the case of the megafauna in the Quaternary, two-thirds of the genera have been lost, and about half of the species over 44 kg in weight have gone in the last 50–3 K years; species loss has accelerated with the growth in human population.

As regards prospects for the future, Donoghue provides a phylogenetic perspective on extinctions in plants, while in a very full and careful analysis, Davies and colleagues consider mammalian biodiversity in a phylogenetic context. The risk depends on where small mammals live and the intensity of threats, but in the case of larger mammals, ecological differences pose a greater risk. Avise ensures that genetic aspects are not forgotten, and indicates three areas that need to be addressed: reticulate patterns in evolution, establishment of Pleistocene parks, and education. I was pleased to see that the last point, and public engagement in general, were the topic of two chapters, by Novack and Bryant, as that aspect is too often passed by in academic works. Finally Ehrlich & Pringle, make the solemn prediction that the fate of the worlds' biota for the next 10 Myr will be determined by what happens in the next 50–100 years.

This is a book which exemplifies many substantial points in the extinction debate that need to be reflected on by any that doubt there is a problem today. It merits the attention of all scientists involved in arguing the case for the conservation of endangered species in both academic and public fora.

Conservation biology for all
Navjot S. Sodhi & Paul R. Ehrlich (eds)
Oxford University Press, Oxford, UK, 2010, xvi + 344 pp, Price £70, ISBN 978-0-19-955423-2.

This is book has been the vision of two remarkable and distinguished campaigners for biodiversity; Navjot Sodhi, a specialist on tropical amphibians who did much to draw the world's attention to amphibian decline, and also one of the Editors of *Biodiversity and Conservation* up to his untimely death last year; and Paul Ehrlich who was amongst the first to stress the integral importance of biodiversity in ecosystem maintenance, coined the rivet-popping analogy, and has repeatedly drawn attention to the threat posed by the magnitude of the human population. Their main aim here was to make up-to-date conservation knowledge widely available, and this has been achieved by their inviting many of the "top names" in the field to prepare chapters on particular topics. They envisioned the

work not only being of value to practitioners, but as required reading in undergraduate and postgraduate courses.

The editors were extremely successful in their recruitment of contributors; the 75 are drawn from 13 countries and include such luminaries as Thomas Brooks, Kevin Gaston, Gretchen Daily, Clinton Jenkins, Thomas Lovejoy, Stuart Pimm, Peter Raven, and Daniel Simberloff, amongst others. Some authors have contributed entire chapters, while, in an innovative approach, others have contributed "boxes" on particular topics. The work starts with an introduction by the two editors which has two poignant boxes by Paul Erhlich: one on human population and conservation, and the other on ecoethics. The message of the dominance of humans and their escalating consumption surely cannot continue to be ignored by politicians, and conservation biologists are urged to support all human actions towards lowering birth-rates. The "ecoethic" advocated is essentially the holistic "land ethic" proposed by Aldo Leopold in 1949: enlargement of the boundaries of community to include soils, waters, and organisms.

The topics covered range from overviews of the history of conservation biology, the definition of biodiversity, and the nature of ecosystem functioning and services; to ones concerned with the processes affecting biodiversity, such as habitat destruction, fragmentation, overharvesting, invasive species, climate change, and fire; and then to ones on conservation actions, for instance extinctions and their prevention, conservation planning and priorities, endangered species management, human-modified landscapes, involvement of the people, implementing conservation science, and the design and analysis of conservation studies. The topics of boxes range from the general (e.g. countryside biogeography, drivers of tropical deforestation, the grass-fire cycle, the state of fisheries) to the specific (e.g. conservation planning in Turkey, invasive species in New Zealand, Australia's giant fireweeds). The end of each of the 16 chapters has a succinct bulleted summary of key points, a suggested reading list of a few books or papers, a list of relevant websites, and then a full list of references cited.

It is pleasing to report that this is a book that lives up to the claim on the back cover that it "provides cutting-edge but basic conservation science to a global readership". Wisely, it does not attempt to embrace details of sampling protocols and inventorying methods for particular groups of organisms, but it does provide essential background material specialists need to have in mind. While the price might be thought to restrict availability in biodiversity-rich but economically poor countries, I was very pleased to learn that the proceeds from its sales were to be used to send copies to conservationists outside western Europe, North America, Australasia, and Japan. This is an altruistic gesture so in keeping with the ethics of the editors, and which it would be great to see emulated by more authors, editors, and publishers.

The ideal of nature: debates about biotechnology and the environment
Gregory E. Kaebnick (ed.)
John Hopkins University Press, Baltimore, MD, USA, 2011, xx + 208 pp, Price US $55, ISBN: 978-0-8018-9888-4.

This book is the product of a three-year research project of the Hastings Center funded by the National Endowment for the Humanities. It aims to advance thinking about nature, appeals to nature, and claims that nature or the natural state possess some special value that should be weighed in decision and policy making. Issues to be addressed include harm due to biotechnological interventions, drugs, life-prolongation, GMOs, and preservation for the benefit of organisms other than humans. These are fundamental issues in the broader

conservation arena and, while as the Editor acknowledges, "consensus" is almost unimaginable on these questions (p. xii), they have to be acknowledged. Thirteen authors, 11 based in the USA, one in the UK and one in New Zealand, combine to do that here. The topics covered are extremely wide-ranging. Conceptual problems around the definition of "nature", and historical attitudes from the late 11th century. The use of "natural" in particular debates, whether it can ever have moral significance, essentialist *vs*. non-essentialist positions, the taxonomy of human attitudes, and appropriateness when considering environmental protection. The gradation from moral to political philosophy, issues surrounding restoration, and recognition that human power should be limited to avoid the spectre of "a world of parks, but not of wilderness" (Eric Katz, p. 81). Stephen Vogel argues for a "post-naturalist" environmental philosophy, as "nature" may have already ended. And if all this was not sufficiently holistic, also raised are issues relating to sport-enhancing drugs, transgender surgery, and the prospect of genetically modified athletes. There is much to reflect on here in relation to what the broader aims of nature conservation should be, and plenty of material that can be used to challenge sometimes entrenched ideas. I found the airing of often avoided questions, and the honest approaches to them in many of the contributions, stimulating and challenging. Anyone likely to have to justify the defence of "nature", in a broad socio-political rather than a scientific arena, will find much of value here to help sharpen their arguments.

Trade-offs in conservation: deciding what to save
Nigel Leader-Williams, William M. Adams & Robert J. Smith (eds)
Wiley-Blackwell, Chichester, UK, 2010, xxvi + 398 pp, [Conservation Science and Practice no. 8], Price £100 or 120 € (hdbk) and £45 or 54 € (pbk), ISBN: 978-1-4051-9384-9 (hdbk) or 978-1-4051-9383-2 (pbk).

This is critical issue in deciding conservation policies and how the restricted monies available should be spent. The Zoological Society of London addressed this in a two-day symposium in November 2007, and this book is based on papers presented at that meeting, which brought together numerous distinguished researchers and managers from diverse parts of the world, many of whom have to continually address the issue. An introductory chapter by the editors summarizes the problems and poses the questions: Are choices in conservation explicitly recognized or debated? What choices remain hidden in conservation policy? And how can the trade-offs that are made daily be carefully weighed up? These themes are developed in 20 chapters arranged in five parts: current approaches and toolkits, the influence of value systems, economics and governance, social and institutional constraints, and future challenges. It is impractical to summarize all the contributions here, but two I felt were particularly poignant. The issues are particularly difficult to address in species-rich groups such as insects and other small invertebrates, and I was pleased these were not forgotten, with Michael Samways presenting a synthetic management approach to their conservation which would also benefit other groups such as the fungi. The other chapter which merits wide attention is that of Georgina Mace, who summarizes the drivers of biodiversity change and sees climate change as the main factor affecting biodiversity loss in the future, becoming even more significant than habitat change. This is a book that deserves to be widely read by those involved in environmental and economic policy as well as by conservation and biodiversity scientists and practitioners. It is a superb and authoritative review of the issues, options, and possibilities, but these will need to be worked out at different levels, from the local to the global.

The ecosystem approach: learning from experience
Gill Shepherd (ed.)
International Union for Conservation of Nature and Natural Resources, Gland, Switzerland, 2008, x + 190 pp, Price not indicated, ISBN 978-2-8317-0957-4.

The year in ecology and conservation biology 2008
Richard S. Ostfeld & William H. Schlesinger (eds)
Blackwell Publishing, Oxford, UK, 2008, 343 pp [Annals of the New York Academy of Sciences vol. 1134.], Price £70, ISBN: 978-1-57331-725-2.

Problem-solving in conservation biology and wildlife management (2nd edition)
James P. Gibbs, Malcolm J. Hunter Jr. & Eleanor J. Sterling
Blackwell Publishing, Oxford, UK, 2008, xii + 328 pp, Price £24.99, ISBN: 978-1-4051-5287-7.

Globalization and new geographies of conservation
Karl S. Zimmerer (ed.)
University of Chicago Press, Chicago, IL, USA, 2006, x + 357 pp, Price US $87 or £55 (hdbk), US $35 or £22.50 (pbk), ISBN: 978-0-226-98343-9 (hdbk) and 978-0-226-98344-7 (pbk).

Biodiversity: an introduction (2nd edition)
Kevin J. Gaston & John I. Spicer
Blackwell Publishing, Oxford, UK, 2004, xv + 191 pp, Price £19.99, ISBN: 1-4051-1857-1.

METHODS IN BIODIVERSITY AND ECOLOGY

Biological diversity: frontiers in measurement and assessment
Anne E. Magurran & Brian J. McGill (eds)
Oxford University Press, Oxford, UK, 2011, xvii + 345 pp, Price £75, ISBN 978-0-19-958067-5.

This is not the first book on the topic of how biodiversity should be measured and assessed, nor will it be the last, but is certainly the most important to date and merits the attention of all those involved in the field. That is not to say it has no short-comings, but the main reasons behind these are the imbalance in the work-force, inevitably reflected in the research literature, between those concerned with vertebrates and plants as opposed to those dealing with invertebrates and other organisms—and often keys to ecosystem maintenance. In a characteristically poignant Foreword, 'Bob' May reiterates this point, which is borne out by the bulk of the examples in the book, as well as his abhorrence of indices involving logarithmic translations. This macro-organism bias is inevitably reflected in the book, but yet there is also another imbalance. Of the 40 contributors, only five are based outside North America and Europe. Having said that, the editors have done a tremendous job in crafting a book to cover key issues and marshalling their authors to produce what 'Bob' May refers to as "a toolkit of useful information and techniques, and also a guide to areas requiring further work" (p. xvii). They also instructed their authors to describe the state of the field, discuss recommendations and future directions, and end with

key points. The key points are an excellent idea, and they often succinctly summarize the bottom lines of chapters hardly penetrable by non-mathematical minds.

The 19 core chapters are organized under five themes: Basic measurement issues; Diversity; Distribution; Alternative measures of diversity; and Applications. I found the contributions on sampling issues and detectability of particular value, and also enjoyed those on assessments of rarity, and on species occurrence and occupancy. Almost all chapters are first-rate, but I was disappointed by those that attempted to deal with assessments by phylogenetic methods and molecular approaches such as barcoding, which were weak in comparison. Further, that on microbial diversity and ecology, which only considers prokaryotes, might have been better omitted. It would also have been great to have a chapter devoted to the special problems of assessments of below-ground diversity and species richness, particularly in the light of recent advances made in their study and their importance in the maintenance of ecosystem processes—and so of the above-ground biota.

The editors contribute a succinct concluding chapter which identifies eight trends in recent biodiversity research under the headings: synthetic trends, special case, statistical approach, spatial/temporal context, comparative approach, non-species-centric measures, continued emphasis and education on the most basic measures, and process based. With respect to "special cases", perhaps a future edition could include a synopsis of methods of assessment used in various groups, such as the series initiated by the Smithsonian Institution, the fourth volume of which on reptiles is discussed later in this collection of reviews. Also skirted round, and perhaps something to be addressed in a future edition, are the issues of All-Taxon-Biodiversity Inventories (ATBI) or executing RAPD site assessments. The latter are often all that can be attempted in many situations in the less-financially endowed regions of the world when conservationists are confronted with having to make rapid decisions on what sites to protect and which to sacrifice.

That this is a book with an emphasis on macro-organisms, especially vertebrates, was inevitable as it is in those that more rigorous approaches have been tested more thoroughly than in the hyperspecies-rich groups. Even amongst eukaryotes, mathematical methods are as yet hardly employed in many, such as nematodes, protists, and fungi. This work will, however, be of particular value to those scientists specialising in those groups seeking to design measures they can apply. It certainly stimulated my thoughts on some aspects of fungal diversity assessments. It should be on the shelves of all active biodiversity researchers, and its use has the potential to enhance the quality of studies and resultant publications, but I fear the price will be a barrier to its reaching many of those who would find it of particular benefit as a way of adding scientific rigour to their assessments of biodiversity.

Community ecology (2nd edition)
Peter J. Morin
Wiley-Blackwell, Chichester, UK, 2011, viii + 407 pp, Price £90 or 108 € (hdbk), £34.99 or 42 € (pbk), ISBN: 978-1-4443-3821-8 (hdbk), 978-1-4051-2411-9 (pbk).

The first edition of this book appeared in 1999, and so was clearly ready for updating. The work is divided into three parts: Communities: basic patterns and elementary processes; Factors influencing interactions amongst species; and Large-scale integrative community phenomena. The first part occupies just over half of the book, and includes a consideration of the different definitions of "community", the author interpreting it as meaning interactions involving at least two species in a single location; this is in contradistinction to "population ecology" which focuses on a single species. "Ecosystems" he sees as one or

more communities occurring together along with their abiotic environment. Treatments of competition, predation, food webs, mutualisms, and indirect effects follow, all packed with information on experiments and modelling and illustrated by examples drawn from diverse kinds of communities. The second part is similarly wide-ranging, covering, amongst other topics, seasonal dynamics (to the Quaternary scale), habitat selection, and spatial dynamics. The third I found especially valuable as it considered such a broad spectrum of issues including equilibrium explanations, stability and complexity, productivity and diversity, succession, and then various applied aspects: disease epidemiology, biocontrol, habitat restoration, nature reserve design, and predicting and managing response to global environmental change. I did miss some account of the various vegetation classification systems in use, and would have liked to see much more depth on the role of fungi and microorganisms in communities rather than the passing treatments in view of their fundamental roles in the maintenance of key ecological processes. It is, however, impossible to be comprehensive in a single volume today. The book arose from courses the author has been giving since 1983, so is well-tailored to final year graduate and particularly postgraduate students in ecology, but will also be of value to biodiversity scientists wishing to understand more of within-community interactions. There is also an e-book version available at the same price as the hardback, and a companion website (www.wiley.com/go/morin/communityecology) from which figures and tables can be downloaded.

Practical field ecology: a project guide
C. Philip Wheater, James R. Bell, & Penny A. Cook
Wiley-Blackwell, UK, 2011, xxv + 362 pp, Price £75 (hdbk), £27.50 (pbk), ISBN: 978-0-470-9428-2 (hdbk), 978-0-470-69429-9 (pbk).

The back-cover of this book states that it "introduces students to experimental design, field monitoring skills for plants and animals, data analysis and interpretation, as well as report writing and presentation". It arose from the authors' experiences in the field with undergraduate and postgraduate students, and aims to cover "all aspects of planning, implementing and presenting an ecological research project" (p. xxi).

This is very much a hands-on book, progressing from project selection and design, site characterization, and especially sampling methods, through to methods of analysis and the preparation of reports. The methods are well-explained and illustrated by clear line-drawings and photographs, and this will thus be a boon to teachers and students wishing to try new methodologies. I was particularly pleased to see the section on report preparation which includes material normally only seen in guides to authors of scientific papers, and such training will certainly help aspiring students set on a scientific career. Sadly, however, the mention of "plants and animals" on the back cover is almost true. The main strength of the book is "mobile organisms", which have 138 pages of methods, as opposed to "static organisms" that receive just 27 pages. Sampling methods are categorized by organism group, and then subdivided, where appropriate, as direct, indirect, capture, and marking. There is a Box (3.2) on techniques used to identify and count microbial diversity, but nothing on the difficulties of obtaining realistic assessments. There is no entry for fungi in the index, and I found none in the text. Lichens have some passing mentions, and also feature in a table with a misleadingly simplified lichen zone scale for mean winter sulphur dioxide levels (p. 61).

This will be a great boom to tutors on residential field courses or lecturers supervising student projects as a part of degree courses, particularly those concerned with animal

ecology, though there is much sound advice for those working on other groups of organisms. It would be wonderful if any future edition could also cover "static organisms" in the same depth as "mobile" ones.

Essentials of ecology
Colin R. Townsend, Michael Begon & John L. Harper
Blackwell Publishing, Oxford, UK, 2008, xii + 510 pp, Price £29.99, ISBN: 978-1-4051-5658-5.

INVASIVE SPECIES

Encyclopedia of biological invasions
Daniel Simberloff & Marcel Rejmánek (eds)
University of California Press, Berkeley, USA, 2011, xxiv + 765 pp, [Encyclopedia of the Natural World No. 3.], Price £65, ISBN: 978-0-520-26421-2.

Invasive species are estimated to cost the US economy around US $100 billion annually, through effects on agriculture and food chains. Potential effects of introductions are one of the greatest threats to native biodiversity, and are often impossible to foresee, for example unexpected consequences of predator/prey imbalances. In this substantial volume, weighing 2.8 kg, every gram is packed with fascinating information which should alert anyone who is unaware to the scale of the problem and wide spectrum of issues that can arise. Arranged alphabetically from "Acclimatization societies" to "Zebra mussel", the entries are an eclectic mix ranging from ones devoted to individual species to particular habitats or general topics, including invasions in particular regions, such as the Hawaiian Islands and New Zealand, and pathogens of humans as well as crops. The editors clearly had a difficult task in selected what to include and what to omit, and then finding authoritative contributors. Individual entries vary enormously in length, and end with cross-references and pertinent literature citations. There is an extensive glossary, and the world's 100 "worst invasive species" are named and shamed (pp. 715–716). Overall, the editors did an excellent job, and the whole is well-illustrated by photographs, line-drawings, graphs, and tables. There is now a one-stop-shop for information on invasives from which lecturers can draw to embellish lectures on this important topic. I hope it may also contribute to the need for a much more heightened awareness amongst those involved in cross-border controls of the risks invasives can pose—and the need to remember that unlisted and unknown species may be amongst the most threatening.

Invasion ecology
Julie L. Lockwood, Martha F. Hoopes & Michael P. Marchetti
Blackwell Publishing, UK, 2007, vii + 304 pp, Price £32.99, ISBN: 978-1-4051-1418-9.

This book shows how far studies of invasives have developed since the days of Charles Elton's classic *The Ecology of Invasion by Animals and Plants* (1958). Elton's examples were mainly drawn from plant pathology and insect pests, but stimulated by publications from the international SCOPE (Scientific Committee on Problems of the Environment) programme on invasive species in 1982–89, interest has grown; the authors' consider themselves "academic children of SCOPE". Terminology can always be a problem, and I found the table of 27 terms used in discussing non-native species (p. 3) particularly

informative. There are chapters concerned with transport and its trends, including a map of former steamer routes. It is also noted that biocontrol agents introduced in good faith can become problems themselves. Disturbance is seen as facilitating invasions, whether by agriculture, fire, or climate change, while establishment can be dependent on biotic interactions, particularly the resistivity of native species. Attention is accorded to the "Escape from natural enemies' hypothesis" which may contribute to weeds in particular being more aggressive as introductions than when in their native habitats. Difficulties of modelling spread are examined, with interesting examples showing huge differences between theoretical models and what was observed, with the cereal leaf beetle spreading at 27–90 km per annum rather than the predicted 1.6–1.7 km per annum—in that case due to the establishment of satellite colonies. There are, however, often long lag-times between establishment and spread, and in some cases interactions with native species can be positive and quite unexpected; for instance the European green crab invasion in California led to the expansion of a clam due to the removal of a competitor. Ecological impacts can also arise through hybridization and introgression with native species. Numerous models and formulae have attempted to synthesize the effect of invasives, but this is viewed as an impossible goal. There will be no simplistic solution. Attention is also drawn to the evolution of invading populations, as founders are not likely to represent total gene pools of a species, and genetic changes may also occur after invasion. Genetically modified organisms can also become invasive, transgenic fish tending to drive native ones extinct. The final chapter is devoted to the difficult issues of prediction, risk assessment, and management. The whole is well-illustrated with details of individual cases featured in boxes, and references are intriguingly categorized into either "Further complexities" or "Companion papers". I found this a superb overview of a complex topic, and also a pleasure to read.

Invasive plants: ecological and agricultural aspects
S. Inderjit (ed.)
Berkhäuser Verlag, Basel, Switzerland, 2005, xviii + 283 pp, Price CHF 198 or 118 €, ISBN: 978-3-7643-7137-1.

A wide-ranging volume with 30 contributors, the majority based in North America, but also including ones from the Czech Republic and India. The work is based on a symposium held at the University of New Delhi in December 2003, where the editor is based. Of special interest is the proposal for a stage-based terminology for invasive plants by Robert I. Colautti. Five stages (I–V) are suggested, some with subdivisions (p. 5): (I) found in a transport vector; (II) identified as introduced to a new region; (III) formation of a self-sustaining population; (IV) several independent self-sustaining populations; and (V) multiple populations generally high in density. Nine papers then concern ecological aspects ranging from historical accounts, the role of niche models, reproduction, residence times, effect on communities, and some particular cases. Seven papers concern agricultural aspects, either dealing with particular weeds and their control by management practices such as tillage or biocontrol agents, or more general aspects, such as reducing the vulnerability of agroecosystems to invasions, human dimensions, and the enormous economic costs as well as consequences for the environment. A useful and well-produced reference work for those concerned with invasive plants either in natural or agricultural ecosystems.

ENDANGERED SPECIES

Species on the edge of survival
IUCN Red List
IUCN, Gland, Switzerland, and Harper-Collins, Glasgow, UK, 2011, 400 pp, illustr., Price £14.99, ISBN 978-0-00-741914-2.

As a contribution to the International Year of Biodiversity 2010, IUCN ran a Species of the Day project throughout the year, with a different species featured every single day. This book brings all 365 selected species together. Pleasingly, these are not just the familiar birds, mammals and reptiles, but also include fungi, insects, mosses, and plants—all arranged alphabetically by their scientific names. The threat categories and scale of the problem are helpfully explained in a short introduction, which also has a succinct history of the Red List system and some hard-hitting facts; at least 18,351 species are threatened with extinction, of which 3,565 are critically endangered: these include 1 in 4 birds, 1 in 3 corals, and 1 in 4 mammals which face extinction. The threat levels of the figured species ranges from data deficient to critically endangered, which is also valuable in stressing how little information we have on so many species that might well be at risk. The photographs are superb, and a few paragraphs and distribution map are provided for each. This has the potential to be a most valuable educational tool, and, if it can be widely distributed amongst those not already concerned about this state of affairs, it has the potential to heighten public awareness. The pages are all still available on the worldwide web (http://www.iucnredlist.org/species-of-the-day/archives) but by the date they appeared and have to be accessed individually for the names and texts; the site is no substitute for the book, however, which makes a much more immediate and forceful impact. Do try and secure a copy, if only to leave it lying around on strategic tables where it might be casually picked up by the uncommitted.

Nature's ghosts: confronting extinction from the age of Jefferson to the age of ecology
Mark V. Barrow Jr.
University of Chicago Press, Chicago, IL, USA, 2009, xi + 497 pp, Price US $35 or £24, ISBN: 978-0-226-03814-8.

URBAN ECOLOGY

Urban ecology: patterns, processes, and applications
Jari Niemelä, Jürgen H. Breuste, Thoms Elmqvist, Glenn Guntenspergen, Philip James & Nancy McIntyre (eds)
Oxford University Press, UK, 2011, xiii + 374 pp, Price £80 US $135 (hdbk), £34.95 US $62.99 (pbk), ISBN: 978-0-19-956356-2 (hdbk) 978-0-19-964395-0 (pbk).

The vision of this ambitious book is to provide insights into the complexities of urban ecosystems and thereby contribute to "our understanding of how such systems function and interact" (p. 1). The project was overseen by Jari Niemelä, one of the editors of *Biodiversity and Conservation*, with the support of five section editors. It involved 57 authors drawn from 11 countries, mainly in temperate regions; none were based in Asia, and tropical regions are represented only by Australia and South Africa. The main focus is consequently developed countries in the Northern Hemisphere, but that is also where most

urban ecology has been carried out to-date, and many of the principles discussed are independent of geographic location.

The introduction explains that early urban ecological studies were mainly problem-orientated, and the subject started to develop only in the 1970s under the stimulus of the UNESCO Man and the Biosphere (MAB) programme. The topic potentially embraces investigations in the natural sciences, engineering, planning, and the humanities. As used in this book, urban ecology endeavours to integrate both basic and applied natural and social science research to explore and elucidate the multiple dimensions of urban ecosystems (p. 9).

The first two sections are concerned with aspects of ecology in cities. Useful synopses of features such as aerodynamic effects of surface roughness, radiation and heat budgets (including "heat-island" phenomena), 3-D structure, emissions, soils, and hydrology (including effects of pavement-types). The ecological footprint of cities, the area required to support it, can be staggering; that of London has been estimated to exceed the total area of Great Britain (p. 19). Special habitats include wetlands, embracing designed landscapes and gardens, and hard surfaces including the buildings themselves. Alien plants often predominate, comprising 78 % of those in Christchurch (New Zealand) and 72 % in Edinburgh (UK). Bird mortality can be a major problem with tall buildings; 26,000 migrating birds are logged as being killed by colliding with a single building in Chicago over the period 1968–1998. On the positive side, 24 species of bats are recorded as living under highway bridges in the USA. Surprisingly, lichens were only accorded less than half a page (p. 97) even though their biomass on buildings and other hard surfaces in urban areas can be considerable.

The third section focuses on the processes affecting urban biodiversity, both positive and negative. Some species have adapted to life associated with humans, such as house sparrows (*Passer domesticus*) that may have started between 400,000 and 100,000 years ago, or developed behavioural skills, such as the crows (*Corvus corvus*) cracking walnuts under vehicle tyres at traffic lights in Sendai (Japan). Special plant habitats are provided by analogues, for example buildings for cliffs (the "Urban Cliff Hypothesis"), pavements, lawns, railway tracks, increased soil diversity, and special microclimatic niches. In the case of arthropods, those that are most successful have high dispersal attributes, but there are often island biogeographic effects between buildings and some new habitats (e.g. refuse heaps). Some carabid beetles are larger in urban than nearby rural areas (e.g. *Abax parallelepipedus* in Birmingham, UK), and a mosquito (*Culex pipeus molestus*). Reptiles and amphibians, characterized as urbanophiles, urbanophobes or urbanoblivious, have suffered marked changes, even within cities; in Washington DC, the number of species present dropped from 49 to 30 between 1950 and 2007. With such a diversity of organisms and interactions, a "metacommunity concept" is commended to explore local *vs*. regional processes, including human and spatial factors, according to three hypotheses: productivity, ecosystem-stress, and intermediate disturbance. Social dimensions including education, culture, life-style, and wealth need to be incorporated. Also floated are fascinating concepts of self-assembly and facilitated-assembly of ecosystems.

Ecosystems, ecosystem services, and social systems are addressed in more detail in the fourth section. "Ecosystem services" are "the benefits human populations derive, directly or indirectly, from ecosystems" (p. 191). These must allow for global effects, as even though 50 % of humans live in urban areas, huge expanses are still urban-free (p. 194), and there are issues of water quality and supply and carbon emissions; in Shanghai (China), carbon emissions amounted to 8.12 tonnes per capita in 1998, but in Stockholm (Sweden) the vegetation assimilates around 41 % of the traffic-created carbon dioxide. The social/ecological transformation involved in urbanization is also discussed from an historical perspective. Originating around 5,000 years ago in modern southern Iraq, it has involved

social change, problem solving, and the creation of foci for diverse activities. The problem today is to "build approaches and systems that instil long-term logic and interests into short-term decisions" (p. 212). This will need a social/ecological system for the governance of ecosystem services. Yet, it must be remembered that the ecosystem approach was "not intended to be applied to complex and fast-moving urban landscapes" (p. 213). The UNESCO URBIS programme aims to contribute to increased understanding, valuing, and reconnection of people and ecosystems in the urban landscape, in order to increase the resilience of urban socio-ecological systems, improve equitable terms of access to resources, and promote adaptive governance of urban landscapes. Issues such as water-borne diseases also have to been taken into account. Planning is of especial importance in conditions of urban sprawl, where green islands, greenways, greenbelts, and buffer zones; so-called "smart growth" in the USA also emphasizes social benefits. The concept of "ecological land-use contemplation" also promotes ecosystem services.

Section five will be of particular interest to those involved in urban design and planning and needing to become more ecosystem-friendly and wishing to make cases. Provisioning, cultural, regulating, and supporting services are summarized, and a substantial table describes the ecosystem function of different types of urban green spaces (pp. 252—255). The problem of applying monetary values to greenspaces is also raised. Human health benefits range from city-wide to the individual, including "Green Gym" and "Horticultural Therapy". Accommodating wildlife requires a combination of regulations, both advisory and legal, various mitigation techniques (neatly summarized in a table on pp. 293—194), and the virtual displacement of habitats, as in the formation of "green" roofs. Models have endeavoured to link social and ecological systems, but these will necessarily be complex and incomplete. Critical in building urban biodiversity in practice will be the provision of financial incentives, regulation, and deliverable targets. The assignment of economic values to ecosystem services may help in securing action, as will the citation of programmes and policies implemented elsewhere which are also introduced.

In the concluding remarks to this thought-provoking and stimulating volume, the need to use language understood by other professions and to deal with the uncertainties inherent in ecology are seen as keys in moving urban ecology forward. The challenge to produce a comprehensive framework or set of principles to deal with complex urban socio-ecological systems, however, remains (p. 321). Nevertheless, this work is certainly a major step along that road, and its accessibility to non-ecologists is enhanced by each section having both introductory remarks and a summary by its editor. It deserves to be brought to the attention of all urban planning authorities, but achieving that will be no easy task.

Applied urban ecology: a global framework
Matthias Richter & Ulrike Weiland (eds)
Wiley-Blackwell, UK, 2012, xiv + 219 pp, Price 102 € or £85 (hdbk), 48 € or £39.99 (pbk), ISBN: 978-1-4443-3339-8 (hdbk), 978-1-4443-3340- 4 (pbk).

This book, appears to have been produced without the knowledge that *Urban Ecology* (reviewed above) was about to be issued. Its' concept was developed as a result of a five-year study "Urban ecology—an international comparison" and it deliberately takes a global approach; the 27 contributors are from China, Germany, India, the Netherlands, New Zealand, South Africa, Sweden, Switzerland, the UK, and the USA. The editors state that it "bridges the gap between theory and practice and presents a broad spectrum of urban ecology approaches from systems research to environmentally sound urban design, exemplified by selected case studies from different continents" (p. 7), and further that its purpose "is to

provide urban ecological knowledge in a nutshell tailored to supporting environmentally sound urban development and based on a sound theoretical and contextual framework" (p. 8).

The editors explain that they consider "applied urban ecology" as a separate research area, countering arguments that it is not distinct from studies in traditional cultural landscapes on the basis of differences in land use and cover, different environmental conditions, other combinations of species, and those involved in urban projects (p. 16). A diagram showing the relationship between different research and planning topics to be considered in thematic and methodical approaches follows. The introductory sections are completed by a chapter devoted to the use of remote sensing techniques, including available satellite sensors. This discusses use at different scales and their particular value in determining urban heat island effects. Various international, regional, and US research and monitoring projects using remote sensing methods are also summarized.

The major part of the book is devoted to selected fields of applied urban ecology: (1) Pathways of the ecosystem approach, including the quantification of spatiotemporal patterns and ecological effects, simulations, and effects on biodiversity and ecosystem processes, with some striking examples from Phoenix (AZ, USA); the design of urban systems is also treated here, along with discussions of energy flow, materials, and resource management and stocks. (2) Socioenvironmental threats, featuring environmental and ecological threats being faced by Indian cities (including air pollution, refuse disposal, and natural hazards), and the conversion of wasteland to "wilderness" in Germany. (3) Flooding and climate adaptation, first takes a geoinformatics approach to assessing flood risks, and then adaptation to climate change through plantings and ingenious ways of modifying the microclimate in localized areas. (4) Urban biodiversity, addresses first the value of domestic gardens in developing countries with South Africa as an example, and then the sourcing of plant materials for use in gardens from Victorian times to innovative designs being tried in New Zealand. (5) Environmental urban design considers the problems encountered in China, including the failure of planning and the need to develop a "green" infrastructure, and features Shanghai 2010 Expo Houtan Park developed on the site of the Expo trade fair. Finally, (6) Environmental urban politics which presents perspectives on a "radical political ecology of water".

In the final chapter, the editors endeavour to provide a synthesis of ecology research and topics to be considered in urban environmental management, mainly drawn from the preceding contributions in the book. They acknowledge the difficulty in generalization as the national and regional differences are so large, and in their last sentence state: "Let this book serve as a stimulus to reflect on the approaches shown here in relation to their respective national and cultural backgrounds and to use them for one's own analyses with the goal of improving the environmental quality encountered!" (p. 211). I can but concur. This is very much a text for the researcher considering approaches and methodologies, rather than a comprehensive reference work for those involved in addressing urban ecological issues on the ground. Consequently, I view it as a complementary to, rather than a competitor of, *Urban ecology: patterns, processes, and applications* reviewed above.

MARINE AND FRESHWATER BIODIVERSITY

The deep: the extraordinary creatures of the abyss
Claire Nouvian

University of Chicago Press, Chicago, IL, USA, 2007, 256 pp, 220 col. plates, Price US $45 or £23, ISBN: 978-0-226-59566-5.

The silent deep: the discovery, ecology, and conservation of the deep sea
Tony Koslow
University of Chicago Press, Chicago, IL, USA, 2007, 316 pp, Price US $35 or £22.50, ISBN: 978-0-226-45125-1.

Drought and aquatic ecosystems: effects and responses
P. Sam Lake
Wiley-Blackwell, Chichester, UK, 2011, xiv + 381 pp, Price £55 (hdbk) and £34.99 (pbk), ISBN: 978-1-4051-8560-8 (hdbk) or 978-1-4051-2411-9 (pbk).

Marine macroecology
Jon D. Witman & Kaustuv Roy (eds)
University of Chicago Press, Chicago, IL, USA, 2009, xv + 424 pp, Price US $95 or £65.50 (hbk) and US $40 or £27.50 (pbk), ISBN: 978-0-226-90411-5 (hdbk) and 978-0-226-90412-2 (pbk).

SOIL BIODIVERSITY

Sustaining biodiversity and ecosystem services in soils and sediments
Diana H. Wall (ed.)
Island Press, Washington DC, USA, 2004, xix + 275 pp, [SCOPE series no. 64], Price US $60 (hdbk) and US $30 (pbk), ISBN: 1-55963-759-5 (hdbk) and 1-55963-760-9 (pbk).

PLANTS

Biología de la conservación de *Vella pseudocystisus* subspecie paui, una planta amenazada en Aragón
Felipe Domínguez Lozano, David Guzmán Otano & Juan Carlos Moreeno Saiz (eds)
Consejo de Proteccíon de la Naturaleza de Aragon, 2012, 308 pp, Price not indicated, ISBN: 978-84-89862-79-1.

Plants and climate change: which future?
Belinda Hawkins, Suzanne Sharrock & Kay Havens
Botanic Gardens Conservation International. Richmond, UK, 2008, 96 pp, Price not indicated, ISBN: 978-1-905164-26-4.

VERTEBRATES

Reptile biodiversity: standard methods for inventory and monitoring
Roy W. McDiarmid, Mercedes S. Foster, Craig Guyer, J. Whitfield Gibbons & Neil Chernoff (eds)
University of California Press, Berkeley, USA, 2012, xii + 412 pp, Price £65, ISBN 978-0-520-26671-1.

The range of organisms is so huge that, even within particular groups, a variety of different approaches and techniques are necessary for detection, identification and inventorying.

This is the fourth of a series initiated from the Smithsonian Institution in 1994, which aims to provide a comprehensive account of the issues and methods available for different groups of organisms. The previous volumes have been concerned with amphibians (1994), mammals (1996), and fungi (2004).

This volume starts with an authoritative overview of reptile diversity group-by-group, including crocodiles, lizards, snakes, tuataras, and turtles. Of particular interest here are tables detailing the numbers of genera and species at the global level and then by continents. The contributions in the main part of the book are arranged in two parts. The first series cover the planning of a diversity study: study design, finding and capturing, voucher specimen preparation, dealing with live reptiles, marking, and determination of age, sex, and reproductive condition. The second series focuses on sampling, techniques for difficult habitats, statistical issues, standard techniques, parametric analysis, population size and demographic studies, and monitoring exploited species. There are also appendices giving details of institutions with significant reptile collections, and an impressive compilation of websites of interest.

The concluding chapter on "where do we go from here?" starts with the salutary quotation by Alfred S. Romer in 1956, "that we known less about modern [reptile] types than we do of many fossil groups". Attention is then drawn to major initiatives, targeted groups, and neglected groups. For the future, the need for base-line surveys and long-term monitoring plans is seen as critical to the development of predictions of changes as a result of future environmental and other modifications. The existence of this volume, to which some 70 leading researchers have contributed their long experience, should do much to facilitate progress along that road.

Greater sage-grouse
Steven T. Knick and John W. Connelly (eds)
University of California Press, Berkeley, CA, USA, 2011, xvii + 646 pp [Studies in Avian Biology No. 38.], Price £65.00, ISBN: 978-0-520-26711-4.

Ecology, conservation, and management of grouse
Brett K. Sandercock, Kathy Martin & Gernot Segelbacher (eds)
University of California Press, Berkeley, CA, USA, 2011, xvi + 356 pp [Studies in Avian Biology no. 39.], Price £48.95, ISBN: 978-0-520-27006-0.

Wolves: behaviour, ecology, and conservation
L. David Mech & Luigi Boitani (eds)
University of Chicago Press, Chicago, IL, USA, 2003, xvii + 448 pp, Price US $52.50 (hdbk) and US $30 (pbk), ISBN: 978-0-226-51696-2 (hdbk) or 978-0-226-51697-4 (pbk).

Island bats: evolution, ecology, & conservation
Theodore H. Fleming & Paul A. Racey (eds)
University of Chicago Press, Chicago, IL, USA, 2010, vi + 549 pp, Price US $65 or £45, ISBN: 978-0-226-25330-5.

The man who saved sea turtles: Archie Carr and the origins of conservation biology
Frederick Rowe Davis
Oxford University Press, Oxford, UK, 2007, xv + 312, Price £17.99, ISBN: 978-0-19-531077-1.

Amniote palaeobiology: perspectives on the evolution of mammals, birds and reptiles
Matthew T. Carrano, Timothy J. Gaudin, Richard W. Blob & John R. Wible (eds)
University of Chicago Press, Chicago, IL, USA, 2006, 547 pp, Price US $95 or £60 (hdbk) and US $40 or £25.50 (pbk), ISBN: 0-226-09477-4 (hdbk) or 0-226-09478-2 (pbk).

The international politics of bird conservation: biodiversity, regionalism and global governance
Robert Boardman
Edward Elgar, Cheltenham, UK, 2006, x + 265 pp, Price £65, ISBN: 978-1-84524-403-9.

INVERTEBRATES

The Royal Entomological Society book of British insects
Peter C. Barnard
Wiley-Blackwell, Chichester, UK, 2011, xi + 383 pp, Price £39.95, ISBN 978-1-4443-3256-8.

A remarkable book, and at a remarkable price. Its existence was made possible by the funds released from the sale of the Royal Entomological Society's premises in Queen's Gate, London, and the move of its headquarters north to St Albans, Hertfordshire. There has been no affordable overview of all the UK's insect groups since Kirby & Spence's *An Introduction to Entomology* (1828, Longman, London) and, as Quentin Wheeler notes in his Foreword, "this volume fills that gap exceedingly well" (p. ix). Peter Barnard was appointed as Director of Science at the Society in 2007, the first full-time entomologist to have been employed by the Society since its inception in 1833. He was evidently an excellent choice.

This is a superb work that should do much to promote and encourage interest in insects and their conservation not only in the UK, but more generally, through its clear expositions and high-quality colour photographs. Of particular interest is a tabulation of described insect taxa by group at levels of the world, Europe, and the UK (p. 3). The British total is given as 24,043 species, around one third of the 72,260 recognized in Europe. Of those 24,043, around 20,000 comprise beetles, flies, hymenoptera, and lepidopterans. As species-level treatments for such a huge number of taxa could not be embraced in a single volume, this one goes down to the ranks of superfamily or family, 558 in total.

Each entry, from the ordinal down, has general information about the taxon, notes on the numbers of families, genera and species, an overview of the classification, and lists species of conservation concern. At the end of each ordinal treatment, there is a list of references, and also of pertinent websites. The superfamily and family entries include references to identification aids, and list the genera known in the British Isles. While there are no keys, the superb colour photographs of representative species, either as larvae or adults, will be of considerable assistance in that regard. In consequence, this book will be of particular value to those needing to identify insects in ecological studies or starting to study them in their own right. It should be available in all field centres and field stations where ecological studies and teaching take place. Further, for the general naturalist, it will be an eye-opener to the diversity of insects even within the British Isles and something they will wish to have to hand on their shelves. It can be unreservedly recommended.

REGIONAL BIODIVERSITY

Wildlife of the Himalayas and the Terai Region
Ashok S. Kothari & Boman F. Chhapgar (eds)
Oxford University Press, Oxford, UK, 2012, 216 pp, Price £45, ISBN: 978-0-19-808395-5.

This large-format work, published on behalf of the Bombay Natural History Society, aims to bring to a larger audience the richness of the wildlife of the Indian Himalayan region through classic writings and stunning full-colour paintings rarely seen outside major libraries or never previously published. The focus is on the macrofauna, especially mammals, but these entries are interspersed with fine illustrations of eye-catching birds (many from Gould's *Birds of Asia*, 1850–1873) and some plants (mainly from Forbes Royle's *Illustrations of the Botany and other branches of Natural History of the Himalaya Mountains and the Flora of Cashmere*, 1839). As was sometimes the case with lavish 18th and early 19th century works, publication costs have been ameliorated through sponsorship of particular plates by various companies and individuals. There are brief introductions to the different groups of larger animals, followed by more detailed information on those selected for inclusion, including names in local languages and information on their diagnostic characters, ecology, distribution, and foods. The bird and plant illustrations are accompanied by shorter treatments. Succinct biographies of the writers and artists are provided at the end, along with a brief bibliography, and the names and addresses of sponsors. This is very much a "coffee-table" book celebrating the beauty and richness of the wildlife of the region, and so will do much to increase awareness of its importance amongst non-conservationists. It is a work to leaf-through and enjoy, and at such a modest cost for such a lavish work could be the answer for those seeking an appropriate seasonal gift for naturalist friends and colleagues. I cannot imagine any naturalist not being pleased to have a copy at hand to browse from time to time.

Tropical montane cloud forests: science for conservation and management
Leendert A. Bruijnzeel, F. N. Scatena & Lawrence S. Hamilton (eds)
Cambridge University Press, Cambridge, UK, 2011 ["2010"], xxvii + 740 pp, Price US $110 or £65, ISBN 978-0-521-76035-5.

Tropical montane cloud forests are remarkable places, seen with festoons of epiphytes dripping water through gaps in swirling mists. Their study is necessarily multifaceted, and in 2004 researchers gathered in Hawaii to review the current state of knowledge on this fragile ecosystem. This *Mountains in the Mist* symposium attracted 102 participants drawn from 25 countries, and this volume is based on presentations from that meeting, supplemented by several invited contributions to fill perceived gaps in the coverage.

The result is an extraordinary compilation of individual studies that will be of value to all working on this precious ecosystem. Its production involved over 170 scientists and a further 60 referees. The scope is enormous and, following a series of contributions on general aspects (8 chapters), presents studies on their biodiversity in regions (11), hydrometeorology (18), nutrient dynamics (8), water use (7), effects of climate variability (8), and conservation and management (11). Most of the contributions are of rather narrow topics, and more reminiscent of what one expects to see in a journal rather than a monograph or reference work; some are also rather too short for the importance of the topic addressed, at least one being barely four pages. On the biodiversity aspect, the focus was very much on plants and vertebrates, with almost nothing of substance on the fungi

(especially lichens that are so important in these forests) and nor on invertebrates (other than lepidopterans). On the positive side, however, many contributions provide extensive lists of references, but on the negative side I found it annoying to have to locate the tipped-in coloured figures section whenever a coloured illustration was cited. Also, and amazingly for a work of its size and complexity, no index is provided; an unfortunate omission as this severely limits the ease with which information on a particular topic can be located amongst the 72 chapters. While the papers-style has material of considerable value to researchers, I wonder how easily a conservationist faced with their management could extract key points to advise actions. Perhaps the editors should consider preparing a complementary guide targeted to practitioners?

The volume forms a part of the International Hydrology Series, which has been developed from the UNESCO International Hydrological Programme which started in 1975.

Antarctic ecosystems
Alex D. Rogers, Nadine M. Johnston, Eugene J. Murphy & Andrew Clarke (eds)
John Wiley & Sons, UK, 2011, xiv + 538 pp, Price £85, ISBN: 978-1-4051-9840-0.

This book represents a "materially changed and updated" version of a series of papers published under the same theme in the *Philosophical Transactions of the Royal Society, B: Biological Sciences* in 2007. It is divided into four sections: (1) *Terrestrial and Freshwater habitats*, containing three chapters, is a disappointing section. The first chapter, on spatial and temporal variability, is a poor start to the book for several reasons. First, Antarctica is defined very broadly and much of the data come from the subantarctic islands, for example Marion Island which lies at a latitude of 46°S, or equivalent to between Paris and Milan in the Northern Hemisphere. As a result, the main Antarctic continent with its predominantly cryptogamic vegetation and microfauna is lumped together with flowering plants and mice. Second, the information from the different areas is mixed together in a confusing manner, and third, there is a lot of jargon, a good example being *spatially aggregated, suitable abiotic conditions*, which I assume, means favourable microclimates. This section fails to properly cover the terrestrial biota, particularly in the main continent, so there is no mention of the endolithic communities, the most extensive in the Dry Valleys. It would be much improved if it had been presented in separate geographical areas or possibly by organism type. (2) *Marine habitats and regions*, containing eight chapters, I found to be an excellent section because most chapters target a single geographic area. The first contains an assessment of climate change on the marine ecosystem in the Western Antarctic Peninsula. Although this is perhaps one of the best documented warming events yet, its origins remain enigmatic. Another chapter looks at "The Dynamic Mosaic" and covers aspects of disturbance and presents an interesting assessment of the importance of various disturbances rating asteroid impact well ahead of trawling, clearly a long-term view was taken. Overall, the chapters contain a treasure trove of information about marine ecosystems and show how much marine research has advanced in recent years. (3) *Molecular adaptations and evolution*, has three chapters (two marine and one general). The recent increase in the use of molecular techniques makes this a fascinating section. The notothenioid fish, which make use of antifreeze to prevent freezing in the subzero sea, are a well-known example of adaptation which is only possible because of the exceptionally stable water temperatures under the sea ice. The surprise is that the larval stages, which one might think would certainly have this protection, seem to have none, thus posing a fascinating physiological question. A general chapter covering all organisms is easy to follow as it treats each group separately, and considerable information has been put together linking genetic variability

and geographic separation. It is now becoming clear that considerable variability occurs in the terrestrial biota with populations often being relict from a previous larger distribution or having extended from refugia. This is a particular problem for assessing the possible effects of climate change as it means that local populations may not be in equilibrium with their environment, a point that, unfortunately, is not effectively dealt with in the book. Finally, (4) *Conservation and management aspects*, has two chapters, and the appearance of being an add-on, but it does provide an excellent source of material about the international legal situation covering conservation and protection.

Overall, I appreciated the book and found it to be a very good synthesis especially of the marine information. My feeling is that there is still some way to go before the effects of a changing world on Antarctic ecosystems can be effectively predicted and perhaps this is the main message of the book.

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ABC Taxa
Yves Samyn, Didier Vanden Spiegel & Jérôme Degreef (eds)
Royal Belgian Institute of Natural Sciences, Brussels, Belgium, 2006–2011, 10 vols, ISSN: 1784-1283, Price: free to developing countries.

This is a series of manuals aimed at taxonomic capacity building in developing countries, and is part of the Belgian response to the Global Taxonomy Initiative GTI) initiated by the Convention on Biological Diversity. It aims to advise on good practice in collection management and taxonomic and curatorial research, and so develop competences and know-how needed to carry out basic to advanced taxonomic research on the particular groups of organisms. It intends to empower those in countries with little taxonomic expertise to make significant contributions to the knowledge of biodiversity in their countries. Each volume is available in hard-copy, CD, and on-line PDF formats. Funding from the Belgian Development Cooperation means that hard copies and CD's can be supplied free of charge to workers in developing countries while stocks last. This is most welcome, and very much in the spirit of the Convention. It would be great if other donor countries could initiate parallel series with volumes targeted on their former colonial territories.

The titles are in English or French, and some have an accompanying CD at the back. They are lucidly and tastefully presented, generally by authors with extensive tropical experience, and while only limited numbers of species can be treated in species-rich groups, the advice on collection and preservation makes them ideal for those starting out in inventory work. The 12 volumes so far available are:

Vol. 1 **Taxonomie des holothuries des Comores**
Yves Samyn, Didier VandenSpiegel & Claude Massin, 2006

Vol. 2 **Détérioration des collections de coquilles**
Roland De Prins & Elhabib Rour, 2007

Vol. 3 **Taxonomy of the *Cryptocarya* species of Brazil**
Pedro L. R. De Moraes, 2007

Vol. 4 **Guia taxonomica de los anfibios de Cuba**
Luis. M. Diaz & Antonio Cadiz, 2008

Vol. 5 **Introduction to the taxonomy of the amphibians of Kaieteur National Park, Guyana**
Philippe J. R. Kok & Michelle Kalamandeen, 2008

Vol. 6 **Sri Lankan Seaweeds—Methodologies and field guide to the dominant species**
Eric Coppejans, Frederick Leliaert, Olivier Dargent, Rasanga Gunasekara & Olivier De Clerck, 2009

Vol. 7 **The Bee Genera and Subgenera of Sub-Saharan Africa**
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The Field Museum, Chicago, IL, USA, 2006, 336 pp [Rapid Inventories: biological and social no. 16], Price US $30, ISBN: 978-0-914868-68-6.

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Perspectives on sustainable resources in America
Roger A. Sedjo (ed.)
Resources for the Future Press, Washington DC, USA, 2008, Price US $80 (hdbk) or 38.95 (pbk), ISBN: 978-1-933115-62-7 (hdbk) or 978-1-933115-63-4 (pbk).

Emerging threats to tropical forests
William F. Laurance & Carlos A. Peres (eds)
University of Chicago Press, Chicago, IL, USA, 2006, xii + 563 pp, Price US $110 or £69.50 (hdbk), US $40 or £25.50 (pbk), ISBN: 978-0-226-47021-4 (hdbk) and 978-0-226-47022-1 (pbk).

Fire in California's ecosystems
Neil G. Sugihara, Jan W. van Wagtendonk, Kevin E. Shaffer, Joann Fites-Kaufman & Andrea E. Thode (eds)
University of California Press, Berkeley, CA, USA, 2006, xv + 596 pp, Price £48.95, ISBN: 948-0-520-24605-8.

ANIMAL WELFARE

Wildlife search and rescue: a guide for first responders
Rebecca Dmytryk
Wiley-Blackwell, Chichester, UK, 2012, xi + 228 pp, Price £85 (hdbk), £34.99 (pbk), ISBN 978-0-470-65510-8 (hdbk), 978-0-470-65511-5 (pbk).

There cannot be many individuals concerned about the safeguarding of biodiversity who have not on some occasion been confronted by an injured animal and striven to rescue it, treat it, bring it back to health, and release it back into the wild. This is a hands-on book by an experienced rescuer offering around-the-clock responses in California. In addition to much general background information, there is information on capture equipment and handling and particular problems. Wild birds take receive the fullest treatment, but there are also chapters on land mammals, reptiles and amphibians, and marine mammals. Other sections cover first aid and stabilization, transport, release and re-uniting, and, if all else fails, protocols for euthanasia. This is a book that it would be sensible for field-staff in nature reserves to have to hand, and also for veterinarians who may have animals they are unfamiliar with dealing with brought to their clinics. Unfortunately the high price, even of the paperback, is likely to deter many that might have found it of value when faced with an emergency requiring the rescue and treatment of an injured animal.

MISCELLANEOUS

Understanding greenhouse gas emissions from agricultural management
Lei Guo, Amrith S. Gunasekara & Laura L. McConnell (eds)
American Chemical Society, Washington DC, USA, 2012, xii + 532 pp, [ACS Symposium Series no. 1072], Price £115, ISBN: 978-0-8412-2654-8.

Experimental evolution: concepts, methods, and applications of selection experiments
Theodore Garland Jr. & Michael R. Rose (eds)
University of California Press, Berkeley, CA, USA, 2009, xvii + 730 pp, Price £30.95 (pbk), ISBN: 978-0-520-24766-6 (hdbk) or 978-0-520-26180-8 (pbk).

The better to eat you with: fear in the animal world
Joel Berger
University of Chicago Press, Chicago, IL, USA, 2008, xii + 305 pp, Price US $29 or £15, ISBN: 978-0-226-04363-0.

Deforesting the Earth: from prehistory to global crisis, an abridgement
Michael Williams
University of Chicago Press, Chicago, IL, USA, 2006, xviii + 543 pp, Price US $25 or £16, ISBN: 978-0-226-89947-0.