

fields, to produce an introductory guide to the variety of techniques available to study avian systems. The book is aimed primarily at young biologists and is written to a level that such a group will find very accessible. At first glance, *Bird ecology and conservation: a handbook of techniques* had me wondering where it would fit among those books already available covering similar topics. After all, Bill Sutherland has already produced two excellent books, *Ecological census techniques* (1996) and *The conservation handbook* (2000), which cover this field somewhat. Similarly, *Bird census techniques* (Bibby *et al.*, 2000) and *Bird monitoring methods* (Gilbert *et al.*, 1998) would also seem to cover some of the subject area. So, despite the previous track record of the three authors in publishing invaluable works in their respective fields, I was initially wondering whether there is actually a need for another volume in this area. I am pleased to say that I was wrong, and that this book does fill a valuable role and will probably find its way onto the shelf of many researchers and practitioners of ecology and conservation. Glancing through the chapters it also became clear that, although a number of books cover the census/survey side of ornithology, until now there has been a distinct lack of a 'one-stop' text that covers the wider group of techniques needed in bird conservation and ecology.

One of the only criticisms I had of Sutherland (1996) was that it covered the field of avian techniques too superficially (although this was necessary given the breadth of coverage in that volume). *Bird ecology and conservation* gives a fuller description of the various techniques available. It also goes a good deal further than the previously mentioned books in describing a whole variety of techniques beyond census and surveying: covering topics such as survival, movement, migration and foraging of individuals and populations, and the techniques required to measure these and other traits. From a conservation point of view, it also has valuable information on habitat assessment and management, conservation management of endangered species and exploitation of populations.

As the authors state in their preface, many of the data presented are available, but widely scattered, elsewhere. This volume therefore aims to pull much of the information into a single, accessible source. One of the strengths of the book is not that it provides the definitive methodology to follow to answer a biological question but rather that it directs readers to the correct method to answer a question and then points them in the direction of specialized literature for much of the finer detail.

The individual chapters are very clear and well written and flow in a logical manner throughout the book. They start with simple techniques for measuring species diversity, then move on to techniques for censusing and surveying individual species, before tackling techniques to infer the ecology of individual species and finally discussing influencing factors such as habitat assessment and management, exploitation and conservation. Among this general flow of themes throughout the book are individual chapters that concentrate on techniques such as radio-tagging, dealing with birds in the hand, extracting information from carcasses, and techniques in physiology and genetics.

There is very little to criticize in the book, although I did find the selection of chapters a little confusing in places: why, for example, have a separate chapter on radio-tagging when the preceding chapter is about techniques to estimate survival and movement (into which radio-tagging naturally fits) and the subsequent chapter is on techniques to study migration (again radio-tagging fits here)? Nonetheless, each of the chapters provides good coverage of its subject area: a result of an appropriate selection of authors for the relevant chapters.

The writing and editing style ensure that the text should be followed easily by all interested readers and is not hampered by scientific jargon peculiar to specific fields. The only chapter that stood out as containing more technical detail was that on estimating survival and movement, although this is necessitated largely by the subject area itself. There were a few discrepancies in terminology between chapters; for example, the alternation between 'bird ringing' and 'bird banding', depending on whether a chapter author was based at an American or British institute, was a little irksome.

I found this a thorough and thoroughly enjoyable book to read, and one that addresses most of the major techniques that can be applied to study the conservation and ecology of birds. It will surely become a standard text for fledgling ornithologists to refer to when thinking about project planning and design to address conservation and ecological questions alike. This is a book that I am sure I will find myself dipping into at regular intervals. It is likely to prove invaluable for those undertaking a research or conservation project in the field of avian ecology for the first time and should prove a valuable reference to stimulate others to think about novel ways of approaching problems.

This is the first book in an intended series on 'Techniques in Ecology and Conservation' (Series Editor: William J. Sutherland) and, as

such, sets a good standard for subsequent books in the series to follow. I look forward to seeing further volumes in the series. The authors are donating 200 copies of the book to libraries in developing countries who would otherwise be unable to obtain a copy. Suggestions for recipients for copies can be made at the Gratis book website: <http://www.nhbs.com/gratis-books>.

STEVE WILLIS

University of Durham
UK

E-mail: s.g.willis@durham.ac.uk

DOI: 10.1111/j.1466-822x.2006.00219.x

REFERENCES

- Bibby, C., Burgess, N.D., Hill, D.A. & Mustoe, S.H. (2000) *Bird census techniques*, 2nd edn. Academic Press, London.
- Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird monitoring methods*. RSPB, Sandy, UK.
- Sutherland, W.J. (1996) *Ecological census techniques*. Cambridge University Press, Cambridge, UK.
- Sutherland, W.J. (2000) *The conservation handbook: research, management and policy*. Blackwell Science, Oxford, UK.

Do parasite organisms have biogeographies?

Poulin, R. & Morand, S. (2004) *Parasite biodiversity*. Smithsonian Books, Washington, USA. viii + 216 pp., figs, tables, line diagrams, index. Hardback: price US\$50.00, ISBN 1 58834 170 4.

I started writing this book review during a research trip in French Guiana, one of the world's hotspots of biodiversity. I often go to French Guiana, where my team is working on several kinds of infectious diseases (e.g. dengue fever, malaria, Buruli ulcer) affecting human communities settled in this equatorial part of France. As a community ecologist and biogeographer working on host-parasite systems, I have always wondered whether those tiny protozoa and other eukaryotic microbes that cause diseases in human and wildlife hosts would display macroecological and biogeographical patterns similar to those described for free-living organisms. There are strong indications that causative agents of directly transmitted diseases do not have biogeographies, and one simple explanation is that large-scale dispersal of these microscopic

parasites may sustain their global distribution. But what about indirectly transmitted parasites, the life cycles of which are partially or totally embedded into various natural environments?

The book by Robert Poulin & Serge Morand, two leading scientists in the field of parasite biodiversity, addresses such important questions using macroparasites, and more specifically helminth and nematode worms, their favourite biological model. First, the proportion of parasites in the global number of species is undoubtedly underestimated. Except for some parasite categories illustrated in this book (see chapters 1 and 2), the virtual impossibility of describing parasite species elsewhere in the biosphere probably makes a global estimate of parasite diversity unachievable. Secondly, what clearly emerges from this book is that for macroparasites we observe approximately the same ecological and macroecological patterns as observed for many free-living taxa, e.g. latitudinal gradient of species richness, nested species structure, mean-to-variance ratio relationships, etc. Thirdly, and what makes the difference with free-living organisms, is that parasites live in hosts which have a limited lifespan, at least compared to natural ecosystems; so host characteristics such as host population density, host size and lifespan are key determinants of the probability of acquiring parasite individuals and species. This is considered in chapter 3 which is, in my opinion, the most interesting because the authors develop a new theory for (parasite) species diversity based on epidemiological principles, then provide some testable predictions regarding patterns in parasite diversity. For instance, in chapter 5, Poulin & Morand discuss the connection between the R -nought value in epidemiology

and body size. Indeed, many parameters for calculating R -nought are related to body size, which proves to be a convenient proxy for many parasite life-history traits that may affect their rates of speciation, diversification and extinction. I personally regret that the authors did not push their ideas further in chapters 3 and 5, as they clearly open new avenues for some promising research in the near future. In Chapter 6, mainstream biogeographers will find some information on the biogeography of parasite diversity with a quite atypical pattern of an inverse latitudinal gradient in helminth parasite species richness for freshwater fishes. Recent findings in the literature have started to disentangle, for gut helminths of birds, the mechanisms that are behind the generation of an often-observed latitudinal gradient in parasite species diversity, with occurrence and composition in intermediate hosts being the main factors responsible for the pattern. Chapter 7 is concerned with extinction in a review of the characteristics that either make parasites prone to extinction or, conversely, hedge them against it, as in the case of the nematode worm *Camallanus cotti*, which keeps infecting marine fishes in closed aquarium systems after several generations despite the absence of copepods, an 'obligate but apparently non-necessary' intermediate host to accomplish its parasite life cycle. Chapter 8 is a rapid *tour d'horizon* on how parasitic environmental pressures may drive host evolution, with special emphasis on the links between parasite species diversity and the level of genetic polymorphism of the major histocompatibility complex in animals. Finally, chapter 9 is a plea for the study and value of parasite biodiversity with, in my opinion, too timid a conclusion on future directions in parasite

ecology as recommended by the two authors. I would have expected more details on the research directions proposed to tackle the many still-unresolved issues, when the authors say that the study of parasites can shed more light on biodiversity theories than can the study of free-living systems.

The book will give community ecologists, macroecologists and biogeographers a good overview of the fundamental characteristics of biodiversity at the parasitic level. One important question today concerns whether or not (parasite) organisms are restricted by geographical barriers. Are they globally distributed on Earth, as many causative agents of contagious diseases are, or locally restricted, as is the case for several reservoir-borne diseases? For parasite organisms which merely provide continuous values for dispersal capacity, we would expect low-to-high global parasite species richness, depending on those parameters. Parasitic micro-organisms in general may have something to offer to macroecology and biogeography, particularly in providing both a diversity of forms and life-history strategies, and experimental tests of species diversity and its evolution. I particularly recommend this book for postgraduate students and professional researchers in community ecology, macroecology and biogeography who want to know more about the wormy world.

JEAN-FRANÇOIS GUÉGAN

IRD, UMR 2724 IRD-CNRS

Genetics and Evolution of Infectious Diseases

Montpellier

France

E-mail: guegan@mpl.ird.fr

DOI: 10.1111/j.1466-822x.2006.00248.x