THE PRINCETON ENCYCLOPEDIA OF BIRDS

Perrins, C. (Ed.) 2009. Princeton University Press, Princeton, N.J., USA. 656 pp, numerous photographs, illustrations, and maps. Soft cover, ISBN 978-0-691-14070-4. U.S.$35. (Published in the U.K. as "The Encyclopedia of Birds" by Oxford University Press, Oxford. ISBN 978-0-19-956800-0. £20.)

This is a revised version of the original 2003 one-volume encyclopedia, also edited by Christopher Perrins. The current version, available only as a paperback, is a dense but readable compendium of information on birds, supplemented by over 1000 photographs, numerous other illustrations and hundreds of range maps. About 150 authors, many of them leading experts on the various bird families, contributed to this book. The book is aimed at the non-specialist reader but should appeal to anyone with an interest in birds.

The introductory sections include *Notes on Classification* and a 14-page précis of ornithology under the title *What is a Bird?* This section focuses on evolution, anatomy (with some excellent illustrations), physiology, breeding etc., mostly considered under a general theme of adaptations for flight. For the novice this is a half-hour Ornithology 101, and for the rest of us, a useful refresher.

The bulk of the book comprises separate sections on each of the 172 avian families. These range from one to 12 pages with most seabird families covered in 4-6 pages. Within each family the material is loosely grouped under subheadings: Form and Function; Distribution Patterns; Diet; Breeding Biology; and Conservation and Environment. The material in these sub-sections covers both the general characteristics of each family and any features that make them special or unique. Within each family section is a *Factfile* box, which includes a global range map, and summarises in point form the family's habitat, body size, plumage, voice, nest, eggs, diet and conservation status.

Focusing on the various seabird families, I found the information interesting, relevant and accurate (to be expected in the second edition and with so many experts contributing). Most of the errors I found were minor quibbles, e.g., page 87 implies that Africa supports gannet populations in addition to the Cape Gannet *Morus capensis*, and page 257 describes sheathbills feeding at whaling stations (perhaps an anachronism from some earlier text). Some readers might question the taxonomic treatment of species. The 2009 edition reflects some of the recent taxonomic changes (e.g., the albatrosses are treated as 21 species and not the earlier 14) but not all (the Nazca Booby *Sula granti* is explicitly still lumped with the Masked Booby *S. dactylatra*). Obviously, given the limited space available, the topics covered for each family are highly selective and probably reflect the interests of the authors. But after a few minutes a reader will come away with a reasonable idea of the biology and lifestyle of any family. The text is obviously aimed at the non-specialist reader but nothing is dumbed-down. Complex topics, such as wing-loading, dynamic soaring, the functioning of the avian lungs, or strategies of fledging in alcids, are covered simply and without jargon but in reasonable detail.

The photographs, all in colour, range from credit-card size to double page spreads. Nearly all are excellent, both in quality and as examples of species or behaviours. Most families also have colour paintings of selected species; these are more variable in quality than the photographs and those of the albatrosses and petrels fail to capture the coloration and jizz of these birds. Sketches of behaviours are also included.

Scattered throughout the book are *Special Feature* photo-essays covering some particularly interesting topics, for example migration, the diversity of nest types, or conservation of shorebirds. Only one of these features seabirds: *Surviving at the extremes* covers the unique breeding in the Antarctic winter of Emperor Penguins *Aptenodytes fosteri*. The book ends with a Glossary, a brief Bibliography (<150 references focused on general publications on birds) and a lengthy Index.

I highly recommend this book. The quality is excellent in all respects and at $35 (even cheaper at some online retailers) for over 650 full-colour pages and informative text it is a real bargain. For the professional ornithologist this book is a handy reference to all avian families and is always fun to dip into to explore birds beyond one's field of expertise or to admire the photographs. For the non-professional birder or novice ornithologist this book is a colourful gateway to the marvels of the bird world. Buy a copy for yourself and get a second for your birder friend – I did!

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AN INVENTORY OF BREEDING SEABIRDS OF THE CARIBBEAN

Bradley, P.E. & Norton, R.L. 2009. Gainesville, Florida: University of Florida Press. 353 pp. Hardcover. ISBN: 978-0-8130-3329-7. US$75.00.

This substantial volume updates the information in two previous compilations of seabirds breeding in the Caribbean (van Halewijn & Norton 1984, Schreiber & Lee 2000), spanning 25 years of "modern" information but including records as far back as published accounts exist, at least to 1880. It covers 23 taxa, and more than the Caribbean (by including Bermuda) but also less than the Caribbean,

by paying scant attention to Aves Island west of Dominica (one of the region's most important seabird breeding sites), and excluding Dominica itself and some of the western Caribbean islands off the coast of Mexico and Central America. The editors say rather plaintively that they couldn't find authors for these, which is understandable except for Dominica where P.G.H. Evans' work over many years seems to have escaped their attention.

The Foreword by John Croxall (editor of the book in which van Halewijn & Norton's original inventory appeared) sets the historical and conservation context, pointing out that seabirds have declined faster than any other bird group – a point reiterated (and graphed: Fig. 30.1) in Patricia Bradley's concluding chapter on Conservation. Croxall also points out that most conservation action is concentrated either in rich countries, or on iconic species such as albatrosses; the focus in this book is on threats to breeding habitat and coastal ecosystems. David Steadman's Preface takes us back centuries rather than decades, pointing out that archaeological sites show clearly that many species were much more widely distributed when people arrived than they are now, and evidently were crucial in supporting early human settlers throughout the region. The editors' "The Inventory: an alarm call for the Caribbean" (Chapter 1) is a sobering summary of the escalating threats to seabirds breeding in a region increasingly dependent on tourism for its economic survival, where "development" and conservation are still seen largely in opposition, local capacity is limited, and the added dangers of global climate change are only beginning to be appreciated.

The bulk of the book comprises 25 chapters on individual islands or island groups, from north to south, starting with Bermuda. Only three species – Bermuda Petrel (Cahow) *Pterodroma cahow*, White-tailed Tropicbird *Phaethon lepturus* and Common Tern *Sterna hirundo* – are known to breed there now; subfossil evidence of breeding Short-tailed Albatross *Phoebastria albatrus* was a revelation to me. Jeremy Madeiros' account pays due credit to David Wingate's sterling work with the few remaining breeding Bermuda Petrels; Lee's (2009) assertion that this work is "hardly acknowledged and not cited" here is extraordinary, as most of p.10 describes Wingate's work and cites four of his publications. This chapter is probably the most optimistic in the whole book, with its account of uniquely successful dedicated hands-on restoration of a seabird population. Nowhere else in the region has comparably positive tales to tell.

The island chapters vary in the depth of data they are able to present, but all attempt to bring information on both sites and species up to date. I wish I could say I was sufficiently familiar with many of these islands to review these chapters in depth, but sadly that is not so; my familiarity is with only Jamaica, the Cayman Islands, Barbuda, Trinidad and Tobago, and mostly woefully out of date. My most recent experience is on Barbuda, and the chapter on Antigua and Barbuda (a two-island state) contains several worrying inconsistencies. Under "Brown Pelican" *Pelecanus occidentalis*, the statement "...they are not known to breed in Antigua" is followed shortly by "...53-55 pairs are nesting off Antigua at Five Islands, Rabbit, Redhead and York Island" – indeed a field trip of the Society for the Conservation and Study of Caribbean Birds, which sponsored this inventory project, had good views of nesting pelicans on Rabbit Island in July 2009. Bird guides on Barbuda – sources of the "traditional knowledge" whose value is increasingly recognised in North America – insist that this species still breeds on Barbuda too, but this chapter does not mention this possibility. Laughing Gull *Larus atricilla* is also not mentioned as breeding on Barbuda, which it certainly did in the 1970s and reportedly still does. Most confusingly, there is no mention of Barbuda in the Roseate Tern *Sterna dougallii* section, but immediately afterwards, under Common Tern, we read "Continued monitoring at Barbuda is warranted, especially among Roseate Tern colonies." I am assured that there is no breeding record of Roseate Tern on Barbuda (J. Prosper, pers. comm.). A random check of selected chapters did not reveal similar inconsistencies, so I do not suggest that the majority of the information is tainted by these uncertainties. While I'm being negative, let me say that the black-and-white plates (two to a page, 22 pages) are poorly reproduced, and Plate 25 may be a Common Tern but is not in breeding plumage as stated.

Following the 25 island-specific accounts are chapters on the GIS database for Caribbean seabirds, the basis for the Atlas of West Indian Seabirds (wicbirds.net), by Will Mackin; and excellent chapters on threats (Norton), overall status (Bradley and Norton), and conservation (Bradley). Anyone interested in seabird conservation issues should read these chapters, irrespective of their level of interest in the Caribbean region; they carry clear, well-argued and well-substantiated messages that deserve a much wider audience than they may receive in this format. Robert Norton's broad-ranging review of threats facing seabirds will likely interest any reader of *Marine Ornithology*; I wished he had gone deeper into the trophic connections between damage to coral reef and inshore coastal ecosystems, and the prey accessible to seabirds, but I am not sure those links have yet been explored by anybody. In their synthesis "Status of Caribbean seabirds" (Chapter 29), the editors do a great job of pulling together the disparate island accounts. Their text needs to be followed carefully, as here they distinguish between "Caribbean" and "West Indies" trends, which differ greatly, due largely they say to discovery of new colonies in the latter. I looked in vain for a clear distinction of the boundaries of the "traditional West Indian region" they address here. Table 29.3 (Caribbean data) shows 11 species declining (by between 11% and 70%) and 5 increasing (by 13-71%), whereas in Table 29.4 (West Indies data) 10 of 11 species apparently increased. The authors caution, rightly, that "comparisons… are problematic and lack scientific rigor due to the great variation in and nonstandardization of the data collection"; do not look here for statistical tests of apparent trends!

Bradley's chapter (30) on Conservation discusses status categories appropriate for a regional approach such as this, and proposes four proposed sets of conservation actions: capacity building, research and monitoring, conservation of breeding sites, and sustainable nature tourism. As a convicted hybrid researcher-conservationist, I particularly appreciate the point made by Ann Haynes Sutton in Chapter 7 on Jamaica that "Well-designed and properly implemented research and monitoring activities are essential components of an effective conservation program", and would like to have seen this argument developed more strongly here.

There are 42 pages of references (the bibliography is now available at wicbirds.net), and a comprehensive 7-page index of both species and sites.

The strength and applicability of this book extend well beyond its title as a Caribbean status report, and I recommend it enthusiastically to all seabird aficionados.

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LONG-TERM ECOLOGICAL CHANGE IN THE NORTHERN GULF OF ALASKA

Spies, R.B. (Ed.). 2007. Amsterdam, Netherlands: Elsevier. 598 pp, numerous color figures, illustrations and photographs. Hard Cover. ISBN-13: 978-0-444-52960-2. US$99, €90, £62.

Robert Spies has edited a bold, broad synthesis of current understanding of the structure and functioning of marine ecosystems in the northern Gulf of Alaska, with particular emphasis on processes driving long-term change in this region. It is truly rare to find a synthesis that places seabird ecology within such a broad context of climatic, oceanographic and ecosystem research. The 14 contributing authors are experts in their respective fields and have assembled an overview of marine ecology that does not shy away from the complexity of the underlying science. The book simplifies what would otherwise be a sprawling, herculean task by adopting a "portal" species approach for higher trophic levels that allows for presentation of considerable detail on 3 species of fish (Pink Salmon *Oncorhynchus gorbuscha*, Pacific Herring *Clupea pallasi*, Walleye Pollock *Theragra chalcogramma*), 3 species of seabird (Common Murre *Uria aalge*, Tufted Puffin *Fratercula cirrhata*, Black-legged Kittiwake *Rissa tridactyla*), 3 species of marine mammal (Harbor Seal *Phoca vitulina*, Steller Sea Lion *Eumetopias jubatus*, Sea Otter *Enhydra lutris*) and 3 species of crustacean (Red King Crab *Paralithodes camtschaticus*, Tanner Crab *Chionoecetes bairdi*, Northern Shrimp *Pandalus borealis*).

The book's interdisciplinary approach takes the reader to the frontier of our scientific knowledge and highlights questions and hypotheses that serve as jumping off points for future investigations and collaborations. In addition to serving marine ecologists, this book is also an accessible primer for anyone interested in ecological change in the northern Gulf of Alaska (e.g., resource managers, policy makers). The authors write to a general audience, going to great lengths to avoid jargon and discipline-specific vocabulary and sprinkle text "boxes" throughout to explain specialized terms and provide additional background for non-ecologists. The book also makes liberal use of color figures and photographs that represent a refreshing contrast to the more Spartan layout of scientific publications.

Beyond introductory and summary chapters, the body of the book is comprised of four core chapters. Chapter two outlines the structure and functioning of marine ecosystems in the northern Gulf of Alaska: geomorphology and climate, physical oceanography, seasonal cycles of phytoplankton and zooplankton production, and finally, the natural histories and survival strategies of each of the 12 portal species listed above. The third chapter covers agents of ecosystem change: climatic forcing and geophysical processes; biological interactions among species (including human harvest of marine mammals and commercially exploited fishes); and contaminants and diseases. The fourth chapter brings chapters two and three together: it describes long-term trends in physical and biological components of these ecosystems and seeks to correlate trends with specific agents of ecosystem change. The fifth chapter deals exclusively with the acute and chronic affects of the *Exxon Valdez* oil spill on the marine ecosystem in Prince William Sound and the western Gulf of Alaska, presenting a thorough, detailed summary of the vast post-spill research effort.

Although there are advantages to treating consequences of the oil spill (one particular agent of ecosystem change) in a distinct chapter, doing so disrupts the structure of a book in which portal species, not agents of change, are the focus of each section in chapter four. Another anomaly in the book's structure is that there are two separate sections in chapter four addressing long-term change in seabirds that overlap to some extent in both geographic scope and subject matter. Analysis of trends in seabird populations and productivity could have been easily merged and improved by discussing the role that reproductive strategies play in the response of different seabird species to agents of ecosystem change. Moreover, while the excellent synthesis of seabird research from Alaska's lower Cook Inlet provides a clear example of how food abundance can drive differential reproductive output and long-term population dynamics in neighboring seabird colonies, there was little discussion of how agents of ecosystem change (e.g. regime shift, oil spill) may have contributed to differences among colonies.

Although the book is limited in scope to the Gulf of Alaska, marine ecologists the world over will appreciate its broad water-to-whales ecosystem perspective and the opportunity to place their study organisms within a broader comparative context. More specifically, seabird researchers from the northern hemisphere will benefit from the comparative review of breeding biology and life-history

strategies of the Tufted Puffin and the widely-distributed and well-studied Black-legged Kittiwake and Common Murre. Ideally, the authors would have included a planktivore in the suite of seabird portal species; however, pragmatic constraints restricted them to three species for which sufficient data were available for analysis. Finally, researchers and managers with a particular interest in Alaskan seabirds will find the synthesis of trends in seabird abundance and productivity in the Gulf of Alaska, comparisons between colonies in the Gulf of Alaskan, Bering Sea and Aleutian Islands, and synthesis of seabird research in the lower Cook Inlet particularly informative.

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THE BIOLOGY OF POLAR REGIONS

Thomas, D.N., Fogg, G.E., Convey, P., Fritsen, C.H., Gili, J.-M., Gradinger, R., Laybourn-Parry, J., Reid, K., & Walton, D.W.H. 2008. Oxford, U.K.: Oxford University Press. 394 pp., Paperback. ISBN 978-0-19-929813-6. £31, U.S.$60.

The Biology of Polar Regions is a revision of the 1998 *Biology of Polar Habitats* by G.E. Fogg. While that is not explicitly stated in the title or on the cover, the authors make it clear in the preface that they have revised the original volume and that recent advances in polar research necessitate the addition of eight new authors. It is one of fourteen volumes in Oxford's successful *The Biology of Habitats* series. This volume is aimed at advanced undergraduate and graduate students taking courses in polar ecology and is an attempt to describe the physiology and ecology of organisms in polar regions. In order to succeed, of course, that discussion must be set in the context of the physical environment.

The current volume retains the chapter structure of the first edition and much of the subchapter structure as well. Chapter 1, *Introduction to the Polar Regions*, sets the scene with a description of the physical geography, energy balance, ocean currents and climate – including how large-scale phenomena such as El Niño Southern Oscillations affect the polar regions. Chapter 2, *Stress, Adaptation, and Survival in Polar Regions*, introduces us to some of the specific challenges that confront organisms and tissues in polar environments. In particular, cold, wind chill and desiccation affect poikilotherms and homeotherms differently, both at the cellular level and the whole organism level. Arguably less obvious are the problems of light (e.g., ultraviolet radiation), day periodicity and the extreme changes of season. These introductory chapters are an excellent summary of these well-known topics and read easily, with a foreshadowing of a more detailed level of understanding.

Chapters 3-8 take on specific habitats within the polar regions. They cover (in order): periglacial and terrestrial, glacial, inland waters, open oceans, frozen oceans, and marine benthos. Chapter 9 (one of two new chapters) follows with *Birds and Mammals in Polar Regions*. These chapters are more variable in how successful they are and they bring up an inconsistency; plant communities, musk ox and reindeer are all introduced in the chapter on terrestrial habitats, but seabirds and other mammals are separated out in a chapter of their own. For context, it would be good to discuss birds and mammals more within their specific environments. It is a reflection of the areas of emphasis of the authors that it isn't until Chapter 4 that they hit their stride. The chapters on liquid and icy habitats are referenced more thoroughly and read more like a text with new information mixed in with well-established topics. They focus on microbial communities and spend considerable effort showing how life occurs anywhere there is liquid water. Most of the new updated material for this volume revolves around microbial ecology in extreme and unusual locations. Most of this is quite good, but occasionally the text falls into a laundry list of microorganisms that can be hard going if you are not already familiar with many of the names. I would have liked a little more discussion of functional groups in some of those places.

In addition to Chapter 9, readers of Marine Ornithology will probably be most interested in the chapters on open oceans (Chapter 6) and frozen oceans (Chapter 7) as well as on the benthos (Chapter 8) because they relate to the lives of marine birds.

The final three chapters return to more general topics. The second new chapter (Chapter 10), *Climate Change in Polar Regions*, is a description of the variation in climate over geologic time with consideration for how present-day changes may affect the biology of the region in the near future. I was disappointed that the authors avoided much detail on present-day climate change by saying it is well beyond the scope of this book. Nonetheless there are some thought-provoking ideas on what may happen in the polar regions in the next twenty years which will be excellent points of discussion in a class that uses this book as a text.

Chapter 11 discusses *Human Impact on Polar Regions*. Starting from the first invasions of humans into the polar regions, it then discusses exploitation in the form of sealing, whaling, fishing, and oil and mineral extraction. Tourism, pollution, the introduction of non-native species and conservation are also covered. The volume ends with a short chapter of conclusions derived from the topics discussed throughout the book.

The book could be used as a university text, but I think this would require additional information to be successful. The coverage of topics is quite broad, though I felt that the success in communicating the important issues was variable. Most importantly to readers of Marine Ornithology, Chapter 9 on birds and mammals is probably the least successful in the book. It is not clear why the chapter is here at all. Clearly the birds and mammals could have been covered as members of the marine and terrestrial habitats where they occur, but the authors decided to pull them out of the systems they affect. By contrast, muskoxen are dealt with in the chapter on periglacial habitats because they are a major component of the ecosystem.

They are not mentioned in Chapter 9. This chapter also has the most frustrating lack of citations. More so than any other chapter, I found myself wanting citations for statements in the text because I found them either intriguing or suspicious. The authors mostly have relied on general texts for much of their information on birds and mammals rather than citing primary literature. On top of the lack of appropriate citations, there are several errors. On page 280, Narwhals are touted as being the deepest diving of all mammals because "it is thought that they can dive to 1500 m". Certainly sperm whales and elephant seals can match or exceed narwhal. In addition, in the section covering whales, humpback whales are not even mentioned. It seems that the new list of authors does not include anyone with first-hand experience with vertebrates.

I was also disappointed in the production of the book. It really is in need of another round of editing. I found dozens of typos throughout the book, and a sufficient number of incorrect statements to put a cloud of suspicion over many other sections. I was particularly baffled by the decision to use colour plates to repeat figures that were already presented with black and white photos. Every colour image is found elsewhere in the text as a black and white. That seems a terrible waste of resources especially when the black and white photos are often too small and of such poor quality that they fail to illustrate their point adequately. In general, the photo illustrations are needlessly too small. I would favour fewer, but larger colour plates. In contrast, the illustrations and graphs were generally good and appropriate and I would have liked more of those in the book.

Despite what seems a long list of my complaints, this book makes an attempt to bring together a huge amount of research into communities and ecosystems of both polar regions and succeeds on many levels. It is the best volume that summarizes current information on such a wide range of habitats. As such it can be useful as a text in an appropriate university-level course. I think its shortcomings, however, dictate that *Biology of Polar Regions* should not be the sole text for such a course.

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