HORMONES AND REPRODUCTION OF VERTEBRATES, VOLUME 4—BIRDS

Norris, D.O. & Lopez, K.H. (Eds.) 2011. London, UK, Burlington, USA, San Diego, USA: Academic Press, Elsevier. 286 pp., 55 black and white illustrations, 10 colour plates. Hardcover: ISBN 978-0-12-374929-1. US$119.95.

This book provides an extensive review of our current knowledge of the endocrinology of reproduction in birds. The book is divided into nine complementary chapters that focus on the neuroendocrine functioning of reproduction in birds and, thus, detail the complex mechanisms and pathways that govern several phases of the reproductive cycles. In addition, several chapters emphasize the role that these endocrine mechanisms play in regulating life-history trade-offs in birds. These chapters therefore explain the relevance of studying these endocrine processes to investigate evolutionary and ecological processes in birds.

The following topics are detailed in this book. First, Ubuka and Bentley review the complex neuroendocrine mechanisms that govern reproduction in birds (i.e. the hypothalamic-pituitary axis). They especially focus on the neuroendocrine regulation of the initiation of breeding and thus provide a physiological basis to better understand seasonal reproduction of bird species. Next, Deviche, Hurley, Fokidis and Johnson review the structure, functions and regulation of testis and ovaries, including current knowledge of the complex structures of testes and ovaries and the hormone-related regulation of their reproductive functions. Interestingly, Deviche *et al.* also detail the functional differences between bird species, placing development of the hormonal regulation of reproduction in a life-history and ecological context. In the fourth chapter, Engelhardt and Groothuis detail how and why several hormones can be found in avian eggs. They pay specific attention to the consequences of contrasting hormone levels in eggs on the development of the chick and the adult phenotype later in life. Finally, they emphasize that the measurement of hormone levels in eggs can be relevant when studying evolutionary processes in birds. In chapter 5, Breuner reviews the influence of stress on reproduction, paying specific attention to the functional role of the main stress hormone in reproduction (i.e. corticosterone in birds.) She details the morphological, physiological and behavioral effects of corticosterone and explains how it can be related to life-history strategies and fitness in the wild. Following this, Riters and Alger review the functioning of the complex neuroendocrine pathways that govern courtship and mating behaviors and synchronize these events with appropriate environmental cues. They especially emphasize the neuroendocrine differences between sexes in the regulation of these behaviors. In an excellent chapter, Carol and Vleck review the hormonal regulation of parental behaviors. Their chapter supports the idea that prolactin, and to a lesser extent corticosterone, are the main hormones regulating parental effort in birds. Ramenofsky emphasizes how endocrinology plays a crucial role in the organization of life-history cycles of birds. She pays specific attention to the endocrine control of the timing of migration and breeding. Finally, Ottinger and collaborators detail how anthropogenic chemicals can disrupt the avian endocrine system and thus affect bird populations through their impact on the physiology of reproduction.

I believe that this book will be very useful to master's and doctoral students as well as early-career scientists who wish to become familiar with the complex topic of comparative endocrinology of reproduction in birds. Importantly, this book explains reproductive endocrinology not only in a classical physiological way, but also in a more ecological and evolutionary way. Thus, it reviews the functioning of the neuroendocrine axes by detailing complex mechanisms that govern the regulation of reproduction (see chapter 1 for an example) but it also emphasizes how endocrine mechanisms can link environmental conditions to reproductive decisions and life-history trade-offs (see chapter 5 for an example). Although the understanding of this book requires some basic knowledge of endocrinology and physiology in vertebrates and is therefore probably too complex for undergraduate students, I believe that it is an excellent tool for master's and doctoral students who are planning to incorporate functional avian endocrinology and evolutionary avian endocrinology into their work. Importantly, I also believe that this book is a very accurate and up-to-date review, and I am confident that it will be very useful to scientists and professors interested in reproductive endocrinology. It is also important to note that the editors, Norris and Lopez, put together several excellent books detailing the hormonal control of reproduction in other vertebrates (volumes 1 to 5 of the series cover fish, mammals, amphibians and reptiles).

This book is dedicated to providing an extensive and accurate review of the endocrine control of reproduction in birds. Although it will be useful to seabird eco-physiologists interested in this topic, it is worth noting that the book does not have a strong focus on seabirds. Indeed, the neuroendocrine control of reproduction is classically studied in laboratory birds and, to a lesser extent, in wild passerine species, but rarely in seabirds. This results from practical reasons, such as the difficulty of holding seabirds in captivity. However, hormonal mechanisms have been increasingly used in the field during the last decades to investigate ecological processes in seabirds. In that respect, several chapters will be useful to seabird ecologists and eco-physiologists, showing why and how hormonal levels can provide useful information on reproduction of birds, including seabirds. Finally, this book definitely focuses more on basic research than applied research and, therefore, I believe that this book will be of limited interest to managers.

I think that David Norris and Kristin Lopez have managed to successfully review our current knowledge of the endocrinology of reproduction in birds. The contributors to this book are all internationally known for their expertise in the field of reproductive endocrinology, and I believe that this book will be a valued reference for avian eco-physiologists in the coming decade.

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THE KITTIWAKE

Coulson, J.C. 2011. London, UK: T. & A.D. Poyser (Bloomsbury). 304 pp., eight pages of colour photographs and numerous illustrations. Hardcover: ISBN 978-1-4081-0966-3. £50.

Kittiwakes *Rissa* spp. are the commonest gulls, distributed throughout the cooler seas of the northern hemisphere, but receive comparatively little attention because they divide their time between leading a pelagic life and breeding on usually inaccessible cliff faces. Over 60 years ago, John Coulson started to study a concentration nesting on the northeast coast of Britain and, with his colleagues, has been investigating their breeding in immense detail ever since, involving thousands of measurements of everything measurable. It had become difficult to keep track of well over 50 resulting papers, and high time for a summary. One feared a deluge of statistics, but they have been kept under control, and this is a clear and concise account of the birds at their breeding sites.

Most of the book is devoted to the widespread Black-legged Kittiwake *R. tridactyla,* but there are periodic comments on the similar and aptly named Red-legged Kittiwake *R. brevirostris,* which occurs with it in the northernmost Pacific, apparently taking more squid and crustacea over deeper water. Black-legged Kittiwakes started breeding on buildings along the River Tyne, and a colony nesting on the window-ledges of an old warehouse, which could be reached for colour-ringing and measuring by opening the windows, were chosen for study until they were evicted in 1990, and then those nesting on nearby Marsden Rock were watched instead.

Kittiwakes are strictly colonial, apparently because they require social stimulation, with the highest breeding success in the centre of colonies. They breed at about three years old, and live about 18 years; there is apparently a higher adult survival but lower breeding success in the Pacific. One of the more interesting observations is that the date of return to the colonies, and to a lesser extent breeding, became earlier as the population increased until about 1990, and then later again, as they decreased. It is not clear why they have been decreasing in recent years; global warming has been suggested, and effects of fisheries, whether through the provision of offal or release of food left unconsumed by fish. There have also been a number of poor breeding seasons attributed to a shortage of sand-eels (sand-lances) *Ammodytes* spp., although there has also been bad weather at more exposed sites.

In general the account seems a little blinkered. While it is stated that in the breeding season Kittiwakes feed largely on sand-eels, they were found to take a wider variety of fish out at sea, with a majority of gadoids (*Marine Pollution Bulletin* 13: 270–273). It is questioned whether they scavenge behind fishing boats as much as has been suggested; but one of their main foods seems to be the vomited stomach-contents of fish brought up by trawlers from deep water, which is apparently why such birds are sometimes found to have taken unexpected deep-sea fish. They may also feed at night more than is reported: in western Scotland, fishermen used to find fish-shoals at night by listening for the "cheepag," apparently birds calling, which seem likely to be Kittiwakes, and there is an account of apparent dispersal of Kittiwakes in the evening and return in the morning seen with radar by Tim Myres in Shetland (*Bird Study* 10: 34–45). They may not all go out to sea after breeding, as suggested, as a good many stay sitting on the shore, presumably completing their moult.

Seabird conservation did not start in Britain in the 20th century, as is said more than once, but with the pioneer Seabirds Protection Act of 1869, provoked largely by the 19th century plume trade, which is not mentioned, followed by general bird protection legislation in the 1880s. It seems doubtful that there were originally so few colonies of Kittiwakes in England and Wales, and the suggestion that recent totals may be inflated by the treatment of counts of individuals in Yorkshire as pairs seems uncertain, as the situation there is very complicated (see W.F. Curtis, *Naturalist* 130: 37–58). Seabird investigations in Alaska did not start after the wreck of the *Exxon Valdez* in 1989, but with the wise Outer Continental Shelf Environmental Assessment Program (OCSEAP) in the 1970s.

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DESCRIPTIVE PHYSICAL OCEANOGRAPHY

Talley, L.D., Pickard, G.L., Emery, W.J. & Swift, J.H. 2011. Oxford, UK: Academic Press. 560 pp., 262 black and white illustrations, 59 color plates. Hardcover: ISBN 978-0-7506-4552-2. US$99.95.

Seabirds are intimately connected to physical ocean conditions, and anyone studying seabirds, either from their colonies, shipboard surveys or through satellite tracking, is undoubtedly interested in understanding how physical oceanography influences seabird ecology. One of the primary focuses of seabird ecology is to determine how physical aspects (e.g. oceanography, weather and climate) influence the behavior and population dynamics of seabirds. Marine seabird ecology is a highly interdisciplinary science, and we often find ourselves seeking succinct descriptions of the physical ocean environment, either to relate to seabirds directly, or to link with the abundance and distribution of their prey. Due to its readable and easily comprehended nature, the 6th edition of *Descriptive Physical Oceanography* by Talley *et al.* (2011) is an essential "field guide" for students and researchers engaged in understanding the relationship between seabirds and their physical environment. As we may rely upon a guide to identify birds at sea, a physical guidebook is also required to help us understand and describe ocean conditions where seabirds are observed.

This 6th edition is a major modern update of Pickard and Emery's classic text on descriptive physical oceanography initially published in 1964 and last revised as the 5th edition in 1990. With the inclusion of two new co-authors, L.D. Talley and J.H. Swift, this extensively revised, resourceful and beautifully illustrated book is well written and widely accessible to a broad audience. The 6th edition clearly reflects the rapid developments in the field over the last two decades. It is divided into 14 chapters ranging from a brief history of descriptive physical oceanography to the dynamics of physical processes and on to highly expanded and revised chapters dedicated to each of the ocean basins (i.e. Pacific, Atlantic, Indian, Arctic and Southern Oceans). It also includes an impressive companion website (http://booksite.academicpress.com/DPO) that provides supplementary chapters (including expanded versions), color versions of all figures, PowerPoint illustration files (handy for talks and seminars) and Java OceanAtlas exercises (including data) upon which many of the book's illustrations and text are based. The Java OceanAtlas addition (http://joa.ucsd.edu/dpo/dpo_joa_examples/background/index.html) is new to this edition and is an amazing testament to the collection and cataloguing of hydrographic data underlying its production.

This book established an excellent reputation at its initial publication nearly 50 years ago, and the authors have done an outstanding job of continuing to target its content to undergraduate and graduate students as well as providing a valuable reference guide to field-based researchers. The introductory chapters on the physical properties of seawater (Chapter 3), typical distributions of water characteristics (Chapter 4), mass, salt and heat budgets and wind forcing (Chapter 5) are easy to follow and are essential reading for seabird ecologists wanting to know more about the ocean environment that seabirds inhabit. Key concepts about the temporal and spatial variability of wind forcing, temperature and salinity of the surface layer, vertical stratification and water mass mixing are beautifully illustrated and pay homage to classic references along with melding together recent references on satellite oceanography, a rapidly growing field of interest to many seabird ecologists.

This book provides a useful reference for those studying the distribution and abundance of seabirds at sea, especially in studies where seabirds and hydrographic properties are mapped simultaneously during shipboard surveys, or where satellite-tracked seabirds are related to satellite oceanographic products (e.g. sea surface temperature, eddy kinetic energy). I highly recommend that students, new and old alike, interested in seabird ecology and preparing to embark on a research cruise, download a copy of Chapter S16 Instruments and Methods: inside they will find one of the best available descriptions and catalogues of shipboard sampling techniques ranging from aspects of research vessel layout, water property measurement, current speed, echosounders and drifter buoys. Within Chapter S16, those interested in applying remote sensing to studies of seabird distribution and habitat use will also find an excellent overview of a variety of satellites and sensors, their uses and limitations.

Seabirds are truly global organisms. As such, they must integrate ocean resources on a variety of temporal and spatial scales that vary across entire ocean basins and between hemispheres. Interpreting the relationship between seabird parameters and ocean-mediated climate change is a rapidly developing field. An emerging standard in studies of seabird and climate change is to relate seabird parameters (e.g. abundance, distribution, production, timing of reproduction and migration) to known climate signals, and seabird studies have generally focused on climate mode indices. In this respect Chapter S15 Climate and the Oceans, available on the book's website (http://booksite.academicpress.com/DPO/suppchapters.php), is essential reading for seabird ecologists interested in the impacts of climate change. From a purely descriptive physical oceanographic point of view, Chapter S15 introduces climate variability and climate change, followed by a discussion of climate modes (e.g. North Atlantic Oscillation, Pacific Decadal Oscillation) and variability for each of the ocean basins described in Chapters 9–14. This chapter provides an excellent overview of the complexity of ocean climate by summarizing and comparing recent studies in a way that helps frame the current status of knowledge and future of this rapidly growing field.

This book and ancillary web-based appendices are a valuable reference for the modern-day seabird ecologist, providing a wealth of baseline information and serving as a language guide for describing physical oceanography. More to the point, this new edition is useful for seabird ecologists stumbling their way through often-thick texts of physical oceanographic models, in trying to understand and communicate how physical oceanographic factors affect their birds, or trying to communicate the ecological importance of seabirds to physical oceanographers who have not thought much about marine biology past chlorophyll. I highly recommend this updated classic text on descriptive physical oceanography.

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STRAY FEATHERS: REFLECTIONS ON THE STRUCTURE, BEHAVIOUR AND EVOLUTION OF BIRDS

Olsen, P. & Joseph, L. 2011. Collingwood, Australia: CSIRO Publishing. 286 pp., black and white illustrations on 173 pp. Softcover: ISBN 978-0-64-309493-2. AU$59.95.

This is a book built around black-and-white illustrations. In the early 1990s the Australian Biological Research Study had nearly completed a volume on birds for the *Fauna of Australia* series, but the plan was abandoned when the vast *Handbook of Australian, New Zealand and Antarctic Birds* (Marchant, S., Higgins, P.J. (Eds.), 1990, Oxford University Press, Melbourne) began publication. Hundreds of illustrations had been completed by Wendy Arthur, William Cooper, Nicholas Day, Ian Faulkner, Jon Fjeldsä, Peter Marsack and Trisha Wright (the latter did the majority of the drawings). The authors of *Stray Feathers* used these illustrations, many of which depict interesting behaviours of a broad spectrum of Australian birds, as the focus of a series of vignettes about the biology and evolution of Australian birds. Many of the images depict a single bird on a page, but others are more complex and some spread across facing pages. Some present only bird images while others include fully rendered backgrounds.

The book begins with an Introduction: Watching Birds by Leo Joseph, which asks anyone watching birds to think about "which interesting corners of evolutionary biology might be illuminated by the birds we are watching?" Evolutionary thinking is the basic theme of this book—every structure or behaviour poses evolutionary questions. The vignettes, which vary in length from a few sentences to several pages, are grouped into a series of sections dealing with aspects of the biology of Australian birds: Anatomy and physiology; The senses; Giving voice; Tongues talking; Plumage; Getting around; Finding and handling food; Optimising foraging and feeding; Reducing competition; Using 'tools'; Communicating; Quality vs. quantity; Courtship; Nests; Parental care; Chicks: behaving badly, behaving well; Living together: same species; and Living together: different species.

At least 12 of the sections contain vignettes that deal with seabirds, including storm-petrels, albatrosses, phalaropes, sheathbills, skuas, terns and gulls, and nearly 40% of the vignettes deal with birds that can be found in marine environments, so there is lots of material that should be of interest to marine ornithologists. For example, the Anatomy and Physiology section has vignettes entitled: "Oil-powered: storm-petrels," and "The salt shedder: White-faced Storm-Petrel *Pelagodroma marina*"; the Communicating section includes the vignettes: "Signaling maturity: Black-faced Sheathbill *Chionis minor*" and "Staking a claim: Black-faced Sheathbill." Getting Around includes "No-flap flight: albatrosses" and "Water wings: Little Penguin *Eudyptula minor*." In many of the sections there are boxed sub-sections called Interludes that deal with more general evolutionary questions, for example: "Form reflects, but can mislead about evolution"; "Evolution of many traits for one purpose," and "Thinking about the oceans as environments—parallels with more familiar terrestrial habitats." A concluding Wrapping Up section re-emphasizes the evolutionary theme followed throughout the book.

The book is intended for a very broad audience, from birdwatchers to amateur ornithologists to professionals. It is not presented in a scientific format in the sense that it lacks in-text references, but there is an extensive Further Reading section, which presents references for each of the text sections. Further, the book should appeal to a broad audience because it is very well written, and as Richard Schodde says in his foreword, "Their text may be packed with information, but it is also lively to read and easy to assimilate, unencumbered by jargon and needless detail. It brings science to the people." I certainly agree with Schodde. The book is packed with well-written prose and interesting information. I have been doing research on birds in Australia off and on for 30 years, but I found lots of things in this book that I did not know, and much of what I know was expressed in a most entertaining and informative manner. The black-and-white drawings are of uniformly high quality and aesthetically pleasing. I cannot imagine anyone interested in birds not fining this book informative and delightful—it is a good read.

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PETRELS, ALBATROSSES & STORM-PETRELS OF NORTH AMERICA: A PHOTOGRAPHIC GUIDE

Howell, S.N.G. 2012. Princeton, USA and Oxford, UK: Princeton University Press. 520 pp., 66 maps, 187 figures, 789 photo studies, 5 tables. Hardcover: ISBN 978-0-691-14211-1, US$45.00; eBook: ISBN 9781400839629, US$45.00.

A paper in the Marine Ecology Progress Series notes that a means or guide to actually correctly identify birds at sea is really needed ("Adding the ocean to the study of seabirds: a brief history of at-sea seabird research," D. Ainley, C.A. Ribic and E.J. Woehler, in press). This book fulfills this need very well (despite its dedication to myself, and more appropriately, in my opinion, to Larry Spear). If you have actually spent any time trying to identify seabirds at sea, you know it is no small feat, especially if you are not in your local waters. It has been too long since the publication of Harrison's *Seabirds: An Identification Manual* (Houghton Mifflin, Boston, 1983), a godsend at the time, because a huge amount of effort of identification of seabirds-at-sea has since been accomplished by keen bird observers to determine how to distinguish difficult species, especially the ones that have recently and suddenly "appeared" as a result of genetic differentiation. Yet this effort had not yet been summarized. However, this book by Steve Howell successfully accomplishes that task, at least for seabirds that have been seen in North American and Caribbean waters.

I was struck speechless upon having a look at this book for the first time. For the past decade, Steve had told me he was preparing a photographic field guide to the seabirds of North America. Little did I know that the result sets the standard for *all* field guides, except possibly those for constellations and trees. The book was born from the frustrations of trying to identify seabirds in the usual conditions encountered at sea, and not those encountered in museums where most other field guides have their roots. Not only does one find the expected species photos (analogous to the images in Harrison) — the bird as if posing close up in the very best of sighting conditions for each of the 70 species covered — but there are also 789 "photo studies" that illustrate how a particular species will look depending on age and stage of molt. Howell covered every possibility, and a high mark in my estimation, even achieving success in photographing how seabirds and their flight are altered in appearance based on wind and sea conditions, such as fog. The weird yet characteristic flight pattern of frigate storm-petrels, for example, is there to see! Photos, where appropriate, show difficult-to-identify species in the same flocks as the species with which they could be confused. Wow! The fact that all this, all the important issues needing to be documented, were apparently laid out in Howell's mind before he began to amass the photos for this book is mind-boggling.

Beyond success at coaching us all on how to distinguish seabirds at sea, Howell also provides a 49-page Introduction that reviews general aspects of seabird-at-sea natural history, including taxonomy, molt strategies (with tables and figures), size and morphology (two tables), habitat affinities (table), and flight as affected by wind (figures). The species accounts include identification summary, taxonomy, names, status and distribution (maps), field identification, habitat and behavior, description, possible hybrids (most photographed), and molt.

This book is far more than a field guide. As well, it is a catalogue of information on North Pacific and Atlantic Ocean (plus Caribbean) seabirds, providing information that is even new to science. This book is an amazing piece of work.

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