THE OCEAN OF LIFE: THE FATE OF MAN AND THE SEA

Roberts, C. 2012. New York, NY: Viking. 405 pp. Hardcover: ISBN 978-0-670-02354-7, US$30.00. eBook: ISBN 9781101583562, US$14.99.

Seldom can a top-ranked researcher present important scientific information to the general public in a compelling and highly readable way — Carl Sagan, Jared Diamond and Richard Dawkins come to mind. Callum Roberts, a professor in the Environment Department at York University in the UK, is a front-line marine biologist (seven papers in *Science* and numerous others in top-ranked journals), educator (he teaches and supports graduate students), award-winning conservation advisor (Pew Fellowship, for example), and is also an excellent communicator and author. His earlier book *The Unnatural History of the Sea,* which dealt with overfishing, won numerous awards. The present book takes a much wider look at the many changes and problems in the ocean as a whole and proposes solutions to some of these.

Roberts begins with a history of life in the ocean. In a brisk, easy style he covers over 4.5 billion years, explaining the evolution and diversification of marine life, punctuated by occasional extinction events. This sets a useful benchmark that he returns to several times in the book to highlight the fact that the conditions we are currently creating, including rising atmospheric CO_2, acidification, siltation and loss of species, have happened in the past, causing devastating reductions in marine diversity and productivity. Without belabouring the point, he makes the reader keenly aware that human-driven changes have similar effects to past mass-extinction events, such as the Paleocene-Eocene Thermal Maximum 55 million years ago.

The book has two parts. Part One (15 chapters and two-thirds of the main text) deals with the many changes brought about by human activities: overfishing, loss of macro-predators, acidification, rising sea levels, pollution, dead zones, plastic pollution, noise pollution, invasive alien species, diseases and more. By the end of this section I was wondering how the author could still have such a cheery face on his cover photo. Roberts doesn't pull punches and provides enough hard data and personal anecdotes to make the reader aware that there are some very serious problems facing the ocean and our species. But there is always a thread of optimism in his writing: he shows that many of the problems are due to failures of our regulatory systems and could be corrected with attention to science and a more ethical approach to human activities. These chapters are not a morbid list of bad news and gloom; Roberts provides sufficient background information that even the most naïve readers will come away understanding some of the physical, chemical and biological processes that keep our oceans alive. Above all, Roberts' engaging text conveys the wonder, complexity and frequent fragility of life in the sea.

Part Two, entitled *Changing Course*, has seven chapters focused on ways we can improve our exploitation and stewardship of the ocean. *Farming the Sea* summarizes the benefits and pitfalls of aquaculture. Aquaculture, which currently produces almost half of the marine food eaten by humans, will undoubtedly increase. Roberts highlights the errors and folly of much of today's aquaculture practices. Other chapters cover rehabilitating the seas, including cleaning up pollution, bringing back the ocean giants that often act as keystone species (whales, big fish), and reducing CO_2 with its inevitable acidification. These chapters are a mix of pessimism (the failure of most international regulatory forums; weak laws governing the high seas; continuing irresponsible fishing) and optimism (growing public awareness of the problems of the sea; increasing numbers of marine protected areas; recovery of some megafauna). Of interest to seabird biologists, Roberts cites the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) as an example of a fledgling nature-first approach to managing marine resources. Signed by 31 countries, CCALMR is not a perfect solution, but in taking into account the needs of whales, penguins, seals and other organisms not eaten by people, it does provide the beginnings of a complete ecosystem approach to ocean management.

There are many sobering points throughout the book. Due to overfishing, the UK fishing fleet is now 17 times less efficient, based on catch per effort, than it was when using boats powered by wind and oars. The Gulf of Mexico's fishing fleet kills more marine life, mostly discarded bycatch, in one day than the *Deepwater Horizon* oil spill did in months. The longlines set every night could wrap around the world 500 times. The annual cost of dealing with alien and invasive marine species is $1.4 trillion. Roberts, a self-proclaimed optimist, thinks there is still time to avoid the worst and recover from past mistakes. Nevertheless, he ends the book with the warning that we'd better be prepared for very different oceans than the pre-industrial ones. Are we ready for near-surface ecosystems dominated by jellyfish?

Seabirds appear occasionally in this book. Birds have served to highlight the effects of oil spills and persistent organochlorine and heavy-metal pollutants. Laysan Albatrosses feature as victims of plastic pollution. The impacts of longline fisheries on birds and other non-target species are covered. The effects on birds of dwindling mudflats, mangroves and saltmarshes are touched on.

The book is obviously aimed at a non-scientist audience – the main text is free of technical jargon, statistics, graphs and other standards of technical literature. As an aside, I found the sole use of non-metric measures, obviously pandering to US readers, a jarring and unnecessary approach. Does anyone outside the US understand the archaic degrees Fahrenheit? Roberts has a gifted ability to convey complex concepts and technical data using only flowing text. Any reader should understand it. For biologists, there is the added benefit of having 40 pages of detailed end-notes and references. Any marine biologist could (and should) use this book as a stepping stone into the primary technical literature on the diverse topics Roberts covers. A common thought among those of us who love the ocean and are depressed by the way humans are treating it is "What can I do to help?" Here Roberts provides logical tips on what seafood to eat and what questions we should be asking of our grocers and politicians. An appendix gives an annotated list of 17 organizations doing good things to protect ocean life.

I'm not exaggerating to say this is one of the most important books I've read in 35 years as a marine ornithologist. I was aware of most of the issues but I still learned a lot. Roberts covers a huge range of topics, showing how many marine problems and changes are interlinked. His words are backed up in the end-notes by up-to-date

and powerful references. Perhaps the best thing about the book is its vivid portrayal of the sparkling wonder of marine life, which makes the greedy and ignorant things humans are doing all the more shocking. If only those self-centred and callous people who populate fisheries management forums and international gatherings on climate change would read this book. If more scientists took the time to produce books like this (or web-pages, blogs and newspaper articles for general readership) we might change the way people view the oceans.

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A FIELD GUIDE TO THE WILDLIFE OF SOUTH GEORGIA

South Georgia Heritage Trust (Burton, R., ed.; Croxall, J., ed. consultant). 2012. Princeton, NJ: Princeton University Press. 200 pp., 368 photographs. Paperback: ISBN 978-0-691-15661-3. US$24.95.

If I were making a trip to South Georgia, as increasing numbers of eco-tourists are doing these days, I would be sure to have in my possession a copy of this book. Further, I would expect that by trip's end it would be dog-eared and coffee-stained, strong evidence of what I believe to be its indispensable nature in such an endeavor. Its heavy paper and rugged assembly are assurances that it would withstand hikes and landings on South Georgia. Except for its initial 7 pages of title and contents, and its 12 final pages of taxonomic notes, photo credits and index of English and scientific names, every page is graced with exquisite photos — oftentimes more than one. In fact, there are 368 photos including those of 180 species taken to exhibit identifying characteristics.

This is a handbook — a tool — for learning firsthand about the natural history of South Georgia, one of the most important sub-Antarctic islands by virtue of its size and climate, giving it a capacity to hold many habitats and thus many dozens of species. It covers both flora and fauna, with the latter extending to invertebrates as well. The one item that this book sorely lacks is a map, other than one depicting the 200 nautical mile exclusive economic zone (EEZ) around South Georgia, its offshore rocks and islets, and the somewhat nearby South Sandwich Islands. In other words, the book actually is about the South Georgia and Sandwich Islands Overseas Territory of the UK. Perhaps it lacks a map for geopolitical reasons?

Except for invertebrates and plants, for which there is usually one paragraph and photo to provide clues to identity, a full-page species account, which includes distribution, identification, voice and behavior, is available for most bird and mammal species. What I really like are the discussions of the history of exploitation of the islands and surrounding waters (an activity that has been and continues to be huge) and of attempts to restore island habitats affected by human activities and by introduction of animals and plants (also shown in species accounts). Really nice are the full-page photos of island habitats, which seemingly could have further graced that missing map showing where these habitats occur. In any case, if you're going to South Georgia or vicinity, get this book!

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EFFECTS OF CLIMATE CHANGE ON BIRDS

Møller, A.P., Fiedler, W. & Berthold, P.J.A. (Eds.). 2011. Oxford, UK: Oxford University Press. 344 pp., 75 black and white illustrations, and a 4-page color plate section. Hardcover: ISBN13: 978-0-19-956974-8, £72.50. Paperback: ISBN 978-0-19-956975-5, £39.00.

Based on the current and predicted rate of global climate change, the 21st century will be dominated by increases in atmospheric temperatures, disrupted patterns of precipitation and increasing sea levels and storm intensity, all of which will have major impacts on the world's ecosystems — as well as on human infrastructure. Current best estimates of global surface temperature increase during this century are 1.1 °C to 2.9 °C for a low carbon-emission scenario and 2.4 °C to 6.4 °C for the highest emission scenario. In coming decades any ornithologist studying birds in the wild, and indeed anyone studying anything in nature, will have to consider how their findings are affected by or related to the changing climate.

The editors of this volume, in anticipation of these impending changes, have assembled a book that discusses the current evidence for climate change affecting avian populations, anticipated future effects and the techniques used to measure them. They recognize, however, that their book is published at a time when recent climate change has been relatively slight, as has been the evidence that this change is affecting the world's bird populations. They acknowledge the emerging status of their volume's subject by stating their desire is to allow the reader "to approach climate change research with the best possible tools."