

## BOOK REVIEW

**Effects of Climate Change on Birds**Reviewed by **Montague H. C. Neate-Clegg**<sup>o</sup>Department of Ecology and Evolutionary Biology, University of California, Los Angeles, USA  
[monteneateclegg@gmail.com](mailto:monteneateclegg@gmail.com)

Published May: 6, 2022

**Effects of Climate Change on Birds**, 2nd edition, by Peter O. Dunn and Anders Pape Møller, Editors. 2019. Oxford University Press, Oxford, UK. 277 pp. \$105.00 (hardcover). ISBN 978-0-19-882426-8. \$56.00 (softcover). ISBN 978-0-19-882427-5.

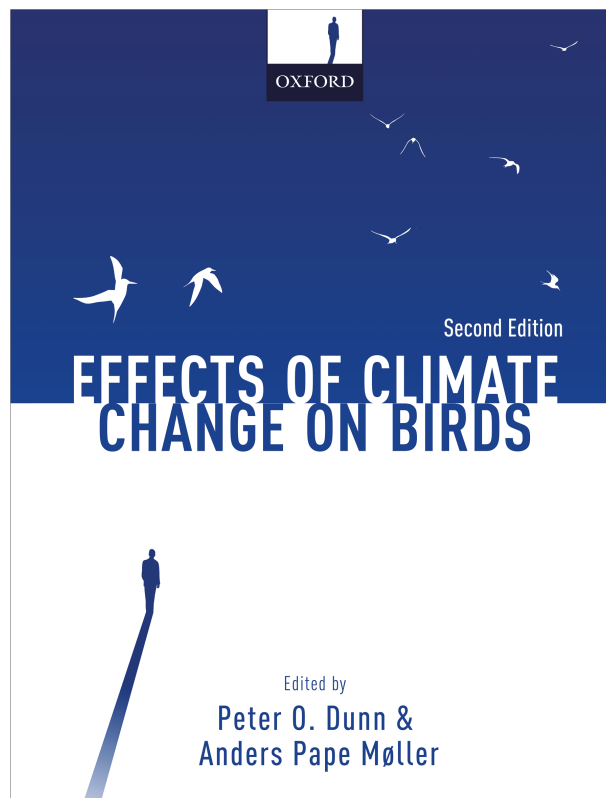
The field of climate change research is moving almost as fast as climate change itself. The world is becoming increasingly aware of the impacts of climate change in everyday life, and research is racing to keep pace by utilizing the exponential growth in big datasets, modeling techniques, and computational power. It is the nature of all things “cutting edge” to become obsolete in short order. As such, it is not surprising that this second edition was sought so soon after the first (Møller et al. 2010). Indeed, it will not be long before the amount of climate change research since the publishing of this second edition exceeds that contained within it. Yet, as a succinct review of the impacts of climate change on birds, this book succeeds both in its initial remit and in its responsibility as an updated edition. The chapters are generally well written with few errors, and the many authors make good use of tables and figures.

The thorough reviews of each subject area provide a decent introduction for anyone interested in climate change impacts but would particularly benefit undergraduates, graduate students, and early-career scientists seeking to begin their own research.

This book aims to give a comprehensive review of the impacts of climate change on birds. It builds upon the previous edition by incorporating the vast number of studies

that have been published in the intervening years and by adding new chapters covering growing subjects within the field. The book is divided into four sections. The first section comprises a single chapter on climate change itself. The second details many of the data sources and techniques that are being employed to tackle climate change ecology. The third section documents the impacts of climate change at the population level, while the fourth and final section examines impacts on biotic interactions. Overall, this structure works well, guiding the reader from first principles to the complex, community-wide consequences of climate change.

New chapters in the second edition highlight flourishing areas of climate change research. For example, Schwartz and Liang’s chapter provides a directory of publicly available climate data that can be implemented into climate change studies, pairing well with Møller and Hochacka’s subsequent chapter on long-term bird datasets. Many readers will be familiar with at least some of these resources, but this chapter outlines each in detail, including the temporal and spatial resolution, climate metrics available, and limitations. Another great addition is McKechnie’s chapter on the physiological impacts of climate change on birds which describes the myriad of ways that high temperatures can modify the metabolism and behavior of birds, with particular emphasis on the avifauna of arid climates exemplified by the Hot Birds Research Project based in South Africa (of which McKechnie is a principal investigator). While this chapter



acknowledges its biogeographic bias, it would have been useful to read more about birds in other contexts, such as tropical rainforests or high-elevation environments.

Despite some great additions to the book, other chapters were removed from the second edition including chapters on time-series analyses and sexual selection. I was disappointed that the chapter on capture–mark–recapture models by Grosbois and Gimenez in the first edition was no longer included. This chapter had provided a useful summary of various population parameters in relation to climate change, and how to model them, which helped to set up the subsequent chapter on predicting population dynamics.

The second section of the book is a great tool kit for early-career researchers. As well as the data sources outlined above, the section includes multiple chapters that together produce a framework on how to investigate questions in climate change ecology. I particularly like van de Pol and Bailey's chapter that includes thoughtful discourse on choosing the right climatic predictors, possible analytical methods, and comparative approaches at different levels of ecological organization. I can imagine this section being required reading for first-year graduate students who are about to start formulating their thesis proposals.

Section three could also be required reading for graduate students, but the reach of this section easily extends beyond students to anyone looking for succinct summaries of climate change impacts. Most of the chapters within this section provide very comprehensive and accessible reviews of the literature. My personal favorite is the migratory phenology chapter by Ambrosini, Romano, and Saino which was well-structured and geographically diverse. Iles and Jenouvrier's chapter on population projections is maybe an exception, being perhaps overly technical and fairly narrow in scope, an issue also for Sæther et al.'s chapter on population dynamics in the second section. Another chapter that perhaps struggles with too much depth is Trenberth and Hurrell's chapter on climate in the first section, where the initial subsections of the chapter give a useful overview of the empirical evidence of climate change in its various forms, but the descriptions of climatic cycles (e.g., El Niño Southern Oscillation) are perhaps too detailed to be of great interest to most ornithologists. This chapter would be more germane if each aspect of climatic change was connected to possible effects on ecology, including physiology, phenology, population dynamics, and biotic interactions.

In the final section of the book, excellent chapters on host–parasite interactions (Merino), predator–prey relations (Bretagnolle), and bird communities (Brotons,

Herrando, Jiguet, and Lehikoinen) convince the reader of the importance of better understanding these interactions in the light of climate change. It is clear that climate change can affect species directly, but the ways in which these effects are propagated throughout interaction networks are complex and require more research attention in the future. Marra, Zuckerberg, and Both's rousing chapter on conservation, replete with good examples of primary research, outlines a comprehensive structure for approaching conservation issues in climate change ecology that leaves readers with a poignant message ringing in their ears. Because of its high impact, this chapter ought to be placed at the end of the section before the closing remarks from Møller and Dunn.

While some research areas are described often in different chapters, there are some important research areas that receive little representation in the book. One that stands out is the lack of research on tropical birds, which comprise the vast majority of avian diversity. In truth, there is a paucity of research in the tropics, but there is still plenty to augment the current chapters or indeed fill new chapters. In future editions, it would be great to see increased representation of research outside of Europe and North America.

In summary, the second edition of this book is a useful and detailed volume, worthy of being on any academic library or bookshelf. The concluding chapter written by the editors summarizes each of the previous chapters, revealing the full scope of the research and scientists who came together to produce this work. It also ends with a review of five areas that are most in need of future research and this serves as a call to arms for young ecologists. Most students and biologists even tangentially associated with climate change or ornithology would benefit from reading this vast array of research all in one place. Readers looking for a well-rounded introduction to climate change ecology may find the first edition more useful, but for those seeking more up-to-date literature, the second edition is a must. In all, I enjoyed and learned a lot from reading this book, and look forward to more editions in the not-too-distant future.

#### LITERATURE CITED

Møller, A. P., W. Fielder, and P. Berthold (Editors) (2010). *Effects of Climate Change on Birds*. Oxford University Press, Oxford, UK.

Book Review Editor: Jay Mager, [jmager@americanornithology.org](mailto:jmager@americanornithology.org)