naturalist" may have done more to enlighten us than we had previously realized.

Gregory Nobles[1,2], [1]School of History and Sociology, Georgia Institute of Technology, Atlanta, GA, USA, [2] for 2016-2017 The American Antiquarian Society, Worcester, MA, USA, ghnobles@gmail.com

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Why Birds Matter: Avian Ecological Function and Ecosystem Services

Çagan H. Sekercioglu, Daniel G. Wenny, and Christopher J. Whelan (eds.). 2016. University of Chicago Press, Chicago, IL. 368 pages, 31 halftones, 6 line drawings, 8 tables. ISBN 9780226382630. $45.00 (Paperback). Also available as an e-book.

Our fascination with birds is as old as our fascination with nature itself, reflected by innumerable works on the diversity, beauty, symbolic strength, and great importance of exploring and understanding biodiversity. This book shows how humans and birds have been interconnected for thousands of years by taking a deep look at avian ecological functions and ecosystem services. The concept of ecosystem services, i.e., such aspects of the earth that benefit humans, puts these relationships into a new and fascinating light. In times of a rapidly growing human population, ongoing agricultural intensification, and transformation and loss of natural habitats and biodiversity, these services become increasingly important. Driven by pioneering scientific work and the impact of global studies on politics and society, numerous studies have clearly demonstrated the incredible variety of natural processes and functions that contribute to healthy ecosystems and human well-being. Birds play a critical key role in providing these services and contribute to all defined classes of ecosystem services, including provisioning, regulating, cultural, and supporting services. Studies of this concept, its omnipresence and impact on all aspects of life and human well-being, illustrate its relevance to our present view of nature and our relationship to it—raising numerous crucial questions for our future.

The authors of this book deal with precisely these types of questions, asking, for example: "How many species perform particular ecological functions? How variable in space and time are they? What ecological factors promote them?" and providing an update on avian contributions to ecological function and ecosystem services. The authors show us, in short, why birds matter. This book delivers exactly what the title promises.

The authors provide a well-structured and complete overview of the topic. In 12 chapters, the ecosystem services provided by birds in all areas of life are analyzed and discussed. This book can be devoured with attention from beginning to end, but it can also be easily read und understood chapter-by-chapter if a reader wishes to browse or look up particular topics. The main part of the book consists of scientific papers, and these papers are preceded by a gripping and comprehensive introduction. The last chapter puts the book into a broader context, discussing related topics such as possible dis-services provided by birds, needs for conservation, and ideas for future directions—all linked to the presented findings. Especially through these well-written introductory and concluding chapters, this book is not only suitable for scientists looking for a comprehensive report on bird-mediated ecosystem services, but also for those who are generally interested in birds and the scope of their ecological functions. The information compiled is therefore relevant and well-prepared for those interested in the concept of ecosystem services in general, or avian

ecological functions specifically, and can be used as a source of inspiration for further work on this subject.

In the individual chapters, well-known scientists reveal the nature and scope of bird-mediated ecosystem services and highlight related open questions in a way that is accessible to a broad readership. For example, the incredible number of people who participate in bird watching and recreational activities (Chapter 1) and the tremendous economic impact of avian ecosystem services (Chapter 2) make clear that the preservation and protection of birds and their functions cover a broad spectrum of interests, which is experiencing a strong and steady growth. In Chapter 1, the authors report that millions of people are involved in outdoor recreation and bird watching, revealing the enormous potential of these activities to improve environmental protection and awareness—just to give one example of an exciting subchapter of the introduction. Chapter 2 shows, with many examples, how both the presence and the disappearance of birds can entail high economic costs and consequences, reports on the heated debates and enormous efforts involved in this field, and the advantages and risks of linking ecosystem services to economic values, markets, and policies.

In Chapter 3, readers learn about the complexity of trophic interaction networks and how they relate to ecosystem services, the external factors they are exposed to today and will be in the future, and the meaning of these findings for global food production and human well-being. These topics are discussed in more detail in the following chapters, with leading international scientists reporting and discussing their findings on the myriad benefits that birds provide to humans, including avian pollination services (Chapter 4), the economic and ecological value of seed dispersal by fruit-eating birds (Chapter 5) and corvids (Chapter 7), the dispersal of plants by waterbirds affecting both wetland and terrestrial habitats (Chapter 6), and the critical role of scavengers in stabilizing food webs and contributing to cultural services (Chapter 8). Two further chapters deal with the importance of birds for nutrient dynamics, cycling, and transport over large spatio-temporal scales (Chapter 9), and how birds that excavate cavities act as ecosystem engineers by creating new habitats, resources, and even tourist attractions (Chapter 10). The penultimate chapter takes a closer look at avian ecological functions in the tropics (Chapter 11), reflecting on and reporting from studies conducted in the Neotropics, Afrotropics, and Indomalayan and Australasian tropics, and how little we still know about these megadiverse regions compared to temperate areas.

It is impressive how comprehensively this book illuminates the current state of scientific knowledge in just 368 pages, including detailed reference lists and a discussion of future avenues of research. All major habitats and life processes are covered, from undisturbed old forests, through agroforest systems to intensively managed and urbanized areas, and from the beginning of sensitive life cycles to their final stages.

The text is also well supported by the selected mix of photographs, figures, and species lists provided. These will be attractive to a wide readership, even if the printed version shows exclusively black-and-white illustrations (aside from the beautiful cover design). The book might be even more attractive for a broader readership if it had more, and especially, colored illustrations. For scientists and other professional-minded readers, the detailed reference lists should also be of interest because they can be consulted for further research. The same advantage applies to the open questions and knowledge gaps highlighted at the end of most chapters.

Why Birds Matter impressively conveys the ubiquitous presence and importance of birds and their ecological functions, pointing out their underlying potential for improving sustainable land use management, biodiversity conservation, and human welfare in general. The content of this book clearly demonstrates the key role that highly mobile and adaptive organisms like birds play in ecosystems worldwide, and that our close relationship with nature and its processes and functions is even more far-reaching than many may expect. Even expert readers may be surprised by how close birds and their ecological functions are to us and how direct these relationships can be. In this respect, this book provides a contemporary view of these relationships and their potential value.

The authors have succeeded in presenting research and background information about

ecosystem services in a complete, exciting, and up-to-date manner. Therefore, *Why Birds Matter* can be regarded as a standard work on avian ecological function and ecosystem services—the first collection available with this extent of knowledge, historical background, and perspective. Subsequent research can build on this work, and hopefully will, because a better understanding and management of ecosystem services appears to provide an opportunity to enter a more sustainable and healthy future by means of scientific and technical progress. As the authors point out, this field holds many challenges and unanswered questions. This book certainly whets the appetite to see how the story continues—and even inspires direct involvement.

Bea Maas, Department of Botany and Biodiversity Research, University of Vienna, Vienna, Austria, beamaas@gmx.at

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