

Wetland Birds

Wetland birds provide us with some of nature's most wonderful sights, from vast flocks wheeling overhead to newly hatched chicks drying in the sun. Apart from their beauty and recreational and economic importance, these birds are excellent indicators of water quality and measures of biodiversity. But how do they use wetland habitats, and how can we best conserve and maintain them for the future? Here, Milton Weller describes the ecology of wetland birds by identifying patterns of habitat use and typical bird communities that result from the use of resources such as food, cover, and breeding sites. He integrates basic and practical information on bird–habitat relationships for researchers, landowners, managers, and birders alike. As wetlands continue to decline, this book will help us to understand the potential and the limitations of wetlands as bird habitats.

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Frontmatter/Prelims

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Habitat Resources and Conservation Implications

MILTON W. WELLER



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To many former students who are doing so much for
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Preface

Wetland birds have long attracted the attention of the public and scientists because of their beauty, abundance, visibility, and social behavior, as well as for their recreational and economic importance. Recently, they have become of interest as indicators of wetland quality, and as parameters of restoration success and regional biodiversity. Recognition of the importance of wetland habitat resources as the dominant influence on the presence and repeated use of wetlands by birds has come slowly, but sufficient information is now available that it seems timely to summarize what we know, and to speculate on what we think we know, as a means of seeking direction for future work. This book is partly a product of my own interest in patterns of wetland habitat use by birds in relation to wetland dynamics. In addition, nonspecialists have been seeking help in using birds as indicators of wetland function or as measures of success in wetland management, restoration, and creation. I have tried to make the book understandable to students of various ages and stages who are interested in wetland birds and their conservation, but some may find more detail than they like. Others with greater knowledge of certain topics will find it advantageous to skip from the known to the less well-known subject matter. The literature on wetland birds now is enormous, but to avoid constant interruption of the text, I have cited literature in some chapters less than some may prefer. However, some chapters list further reading material not cited in the text; in both sections I have tried to include classics in the subject area and more recent papers or books that provide summaries of pertinent literature. Words or phrases that are important to the understanding of the topic and that are in common use in the field are in **bold-face** type and usually are defined directly or by example.

The focus of the book is on how wetland habitat resources influence its use by birds in general rather than on any specific taxonomic group of birds, or their breeding biology – a separate but massive subject in itself. I have used the term **wetland birds** in the title to provide a habitat focus that considers birds adapted to a wide range of relatively shallow waters through to those in wet-soil habitats. The term **waterbirds** is often used for these various groups, commonly identified by habitat- or resource-related descriptors: divers (especially loons), waterfowl (wildfowl in Europe, but also used broadly like waterbirds),

waders (herons in Europe), shorebirds (waders in Europe), littoral or water-edge birds, aquatic birds, coastal birds, and estuarine birds. Some of these groups of birds avoid saline wetlands but may use coastal or inland wetlands as long as they are freshwater; others use mainly saline wetlands. Some species may use either fresh or saline wetlands but use is influenced by factors other than salinity: for example, life cycle function such as breeding or nonbreeding periods. The book does not treat species of the deep-ocean (i.e. **oceanic**, **pelagic**, or **seabirds**) except as they come to coastal wetlands to nest, feed, or roost in shallow and food-rich waters. The last usually nest in groups and have attracted the attention of ecologists and ornithologists, who have focused on the social behavior of **colonial waterbirds**, a term that includes many freshwater species as well. Overlap in categorizing such birds by habitat characteristics reflects both the dynamic nature of wetlands and the evolution of great adaptability to exploit wetland resources wherever they are.

To aid the interested but less experienced, I have included a chapter describing the various taxonomic groups that use wetlands, with emphasis on habitat adaptations, foods, and habitat-influenced breeding biology. The reader will find a wide range of birds, from those groups where most species are **obligate** users of wetland habitats through taxonomic orders or families where only a few species are so restricted to those that are regular users but do so **facultatively**. Obviously, almost any bird that happens to be at a wetland edge may occasionally exploit wetland resources such as water or food opportunistically. This range of variation may disturb some readers who search for simple patterns, but it reflects the dynamics of many wetland habitats and the amazing flexibility of birds. Although photographs throughout the book provide examples of activities and adaptations of various wetland bird species, the book does not deal with identification. Several bird guides covering specific taxonomic groups or geographic areas have been included in the bibliographies. To save space and simplify reading, scientific names are given in Appendix 1 for birds, Appendix 2 for other animals, and Appendix 3 for plants.

Most books written about the taxa of birds that regularly use wetlands have been taxonomically structured even when emphasizing life-history information. Moreover, habitat descriptions have been limited or lacking in many such books partly because of the absence of information on species and adaptations to resources such as food, but also because of the difficulty of finding widely recognized descriptive terms. This is rapidly changing because of current interest in the conservation of natural habitats as the essential approach to preserving threatened species and maintaining regional biodiversity. This much-needed habitat focus has increased the need for information on the environmental resources likely to be found within the habitat. Several recent books on wetland birds reflect this growing habitat interest, and hopefully this discussion as well as the publications cited will encourage further descriptive as well as integrative work.

After an introduction to habitat concepts essential to provide an equal

footing for all readers, subsequent chapters of the book will outline wetland diversity and classification, review the major groups of bird that use wetlands, consider how wetland features influence bird biology and adaptation, elucidate how birds can influence wetlands, examine methods of describing potential wetland microhabitats, and identify how we might relate changes in wetland bird communities to the dynamics of habitat resources over time and space. Opportunistically throughout the text, I shall try to relate patterns to potential application in the conservation and management of wetland birds, and additional issues will be summarized in several chapters near the end of the book.

This book reflects my biases by virtue of experience with certain taxonomic groups, geographic areas, and literature, but I hope the examples reflect a view of species as part of a community and consider the features and dynamics of habitats as driving influences on the evolution of bird groupings as well as on species' attributes. For groups I know poorly, I have tried to incorporate examples documented in the literature. I suspect this will satisfy few specialists in those areas, but I hope there is enough information to allow us to focus on general patterns. Many patterns will serve only as hypotheses for future testing, which should help determine not only what occurs but how and why such patterns exist. Therefore, it is especially important for readers to evaluate general statements of apparent patterns analytically.

Asking general questions important in wetland ecology may be relatively easy – but answering them is not! What is it about wetlands that produces such concentrations of birds, both in breeding and nonbreeding periods? Unlike our expectation of terrestrial birds, why are they often present in one year and not another? Why are many of the groups so widely distributed and among the most mobile animals in existence, whereas other species have modest ranges and are so scarce that the list of endangered wetland species is long? How has this habitat influenced breeding biology and life-history strategies? Why are some birds not represented among wetland users, and what does this tell us about the wetland ecosystem? How can we apply our knowledge, even when minimal, in a conservation strategy of protection, management, or restoration?

Persons wanting to preserve wetland bird communities, enhance bird populations, preserve species' diversity through management, or to use birds as an index for assessing habitat quality usually want to know which single habitat feature is most important to birds, how data can be gathered quickly, and how this knowledge can be applied in a simple and practical way. Unfortunately, ecological problem-solving is neither simple nor conclusive. The answer requires not only a significant amount of life-history information about each bird species or group in question, but consideration of the quantity, quality, and dispersion of biological resources such as food, vegetation, and other animals; additionally, a knowledge of physical features such as water, ice, and geomorphology are essential. Issues of **spatial scale** (size, shape, and disper-

sion of components) and **temporal scale** (daily, seasonal, annual, irregular but still time-related influences) complicate the picture further. Therefore, most problems are, as in all natural ecosystems, multivariate and difficult to test and to use to draw indisputable conclusions. Much of the book will emphasize understanding such difficult questions, but I suspect that I will answer too few of them. That is, however, part of the strategy of the book: most generalizations induce questions on the basis of personal experience – to the ultimate good of science. To that end, I do not hesitate to generalize with the hope that such statements result in challenge, additional insights, observation, and, ultimately, new information.

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