

Birds and Habitat

The successful conservation of bird species relies upon our understanding of their habitat use and requirements. In the coming decades the importance of such knowledge will only grow as climate change and the needs of human populations intensify the already significant pressures on the habitats that birds depend on. Drawing on valuable recent advances in our understanding of bird-habitat relationships, this book provides the first major review of avian habitat selection in over 20 years. It offers a synthesis of concepts, patterns and issues that will interest students, researchers and conservation practitioners. Spatial scales ranging from landscape to habitat patch are covered, and examples of responses to habitat change are examined. European landscapes are the main focus, but the book has far wider significance to similar habitats worldwide, with examples and relevant material also drawn from North America and Australia.

ROBERT J. FULLER is Director of Science at the British Trust for Ornithology, where he leads the Ecological Change Group. He has studied habitat relationships of birds throughout Britain and many parts of Europe for 30 years. Much of his recent work focuses on the effects of different forest management systems and increasing deer populations on biodiversity.

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Preface

Relationships between organisms and their habitats are central to many themes in ecology and evolutionary biology. Studies of birds have made large contributions to the understanding of how habitat can interact with population dynamics, community structure and behaviour. The adaptive value of habitat choices is also especially well illustrated by research on birds. In the last three decades there have been large advances in knowledge about the mechanisms affecting habitat selection, especially concerning the role of behavioural and landscape-scale processes. As the complexity of interactions between birds and their environments has become more fully appreciated, the difficulties of achieving a synthesis have escalated.

This book examines bird-habitat relationships mainly in the context of temperate cultural landscapes. The emphasis is on western Europe, but many chapters draw heavily on research emanating from other continents, notably North America. This approach has the advantage of making the subject more manageable, but it also stresses the multi-layered influences of human activities on habitat suitability for birds. Although the book is not overtly concerned with conservation, much of the material summarised in these pages has been accumulated through a strong desire on the part of researchers that a rich biodiversity should thrive alongside humans in the cultural landscapes of the future.

Part I contains seven chapters examining general patterns and processes in the habitat relationships of birds. Concepts of selection, use, occupancy and quality of habitats are reviewed in Chapters 1 and 2. Habitat associations of many bird species show striking variation in different parts of their ranges and this is explored in Chapter 3. The fact that patterns of habitat selection and habitat use vary spatially has serious implications for the generality of conservation strategies. Chapter 4 examines the evidence supporting the wide range of landscape-scale processes that have been proposed to affect birds. Chapter 5 offers a more specific review of how birds respond to the ecological transitions that are prominent in many cultural landscapes. Chapter 6 outlines the land-use processes, historical and contemporary, that have produced

the complex and diverse cultural landscapes we see today. This chapter asks whether such landscapes tend to favour generalist species. Habitat heterogeneity is an important concept underlying biodiversity patterns within patchy cultural landscapes. This is examined in Chapter 7 in the context of European farmland birds which have been the subject of intense investigation since the early 1990s.

Part II presents seven ‘case-study reviews’ of bird–habitat relationships in different environments. These illustrate the variety of factors that can limit habitat occupancy and determine habitat suitability for birds in different contexts. The focus is Britain, where there has been a wealth of work on the selected environments, but the chapters are relevant in wider geographical contexts. These chapters do not provide comprehensive coverage of western European habitat types; they are presented as examples of the diverse nature of bird–habitat relationships. Two deal with moorland and mountain, two with freshwater wetlands, two with coastal wetlands and one considers woodland.

Part III presents broader perspectives on birds and habitat. Few species have been examined in greater depth worldwide than the red knot *Calidris canutus*. The insights into what constitutes habitat quality for this species, gained through a powerful blend of ecological, behavioural and physiological approaches, are summarised in Chapter 15. Habitat-based processes operating at the level of the individual bird are critically important in the dynamics of populations; this theme is explored in Chapter 16. Implications of changing climate for habitat quality, especially from the viewpoint of phenological mismatching, are discussed in Chapter 17. Perspectives are then provided from Australia and North America, the continents that have generated the greatest recent advances in understanding the multi-scaled nature of bird–habitat relationships. There are interesting questions about how relevant the findings are from these continents to European landscapes. Chapter 18 reviews how landscape change since European colonisation has affected Australian birds while Chapter 19 contrasts research approaches and findings between North America and Europe in the context of four different landscape types. Chapter 20 concludes the book with some general themes and emerging questions, taking a particular focus on conservation strategies.

I am grateful to the authors for the precious time they have devoted to producing their chapters. I also thank the reviewers of the chapters. My employer, the British Trust for Ornithology, generously allowed a sabbatical during which I laid the foundations of this book. Dominic Lewis and his colleagues at CUP have been patient sources of advice and encouragement. Carole Showell tracked down various elusive publications. Nicki Read gave great support with many aspects of the preparation of this book.