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978-0-521-57181-4 - Bird Conservation and Agriculture

Jeremy D. Wilson, Andrew D. Evans and Philip V. Grice

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## Bird Conservation and Agriculture

Populations of many species of farmland birds in Britain collapsed during the 20th century, creating one of the biggest conservation problems of the day and sparking a wave of research to find out why this happened, and devise practical solutions. This book summarises this story, exploring relationships between bird populations and agricultural land management. The first part of the book sets the historical context of change in agriculture and bird communities since the 18th century, and introduces the bird communities of agricultural land today. The second part provides an overview of this very active area of applied conservation science, including in-depth case studies of 16 species that have been the subject of detailed research effort and that, taken together, illustrate the many ways that agricultural intensification has affected bird populations. The last part shows how this evidence base, coupled with recent greening of agriculture policy, has provided opportunities to manage agricultural land to better integrate the needs of food production and bird conservation. The book concludes with a look forward to challenges that the conservation of bird populations on agricultural land is likely to face in the near future.

JEREMY D. WILSON has worked on the ecology of birds in agricultural systems since 1991, first at the British Trust for Ornithology and then at Oxford University. He joined RSPB in 1996 and is now Head of Research for RSPB Scotland. He is an Editor for the British Ornithologists' Union journal *Ibis*, and an Associate Editor for the British Ecological Society's *Journal of Applied Ecology*.

ANDREW D. EVANS joined the RSPB as a field biologist in 1988, studying the reasons behind the near extinction of the curlew in the UK. This put him at the forefront of the unfolding story of bird population declines as a result of agricultural intensification. He is currently Head of Species Recovery at the RSPB.

PHILIP V. GRICE has worked professionally as an ornithologist in the government's nature conservation bodies since 1991, and is now a Senior Specialist in ornithology at Natural England. He has worked on a broad range of bird conservation issues but has become increasingly concerned with addressing the declines in farmland birds since the mid-1990s.

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The world's biological diversity faces unprecedented threats. The urgent challenge facing the concerned biologist is to understand ecological processes well enough to maintain their functioning in the face of the pressures resulting from human population growth. Those concerned with the conservation of biodiversity and with restoration also need to be acquainted with the political, social, historical, economic and legal frameworks within which ecological and conservation practice must be developed. The new *Ecology, Biodiversity, and Conservation* series will present balanced, comprehensive, up-to-date, and critical reviews of selected topics within the sciences of ecology and conservation biology, both botanical and zoological, and both 'pure' and 'applied'. It is aimed at advanced final-year undergraduates, graduate students, researchers, and university teachers, as well as ecologists and conservationists in industry, government and the voluntary sectors. The series encompasses a wide range of approaches and scales (spatial, temporal, and taxonomic), including quantitative, theoretical, population, community, ecosystem, landscape, historical, experimental, behavioral and evolutionary studies. The emphasis is on science related to the real world of plants and animals rather than on purely theoretical abstractions and mathematical models. Books in this series will, wherever possible, consider issues from a broad perspective. Some books will challenge existing paradigms and present new ecological concepts, empirical or theoretical models, and testable hypotheses. Other books will explore new approaches and present syntheses on topics of ecological importance.

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# *Bird Conservation and Agriculture*

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## Preface

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Recent estimates suggest that over a third of the world's land surface, over a third of terrestrial primary production and over a half of freshwater primary production are appropriated by human food chains (Gerard 1995; Tilman *et al.* 2001), a proportion that continues to increase as the global human population rises. Conversion of land to agriculture and the subsequent intensification of agricultural management are concerned with maximising the proportion of primary production that is channelled to human consumption, and to the extent that this is achieved, the rest of wild nature is bound to suffer (Krebs *et al.* 1999).

In many parts of the world, conservation is a backs-to-the-wall battle to protect remaining areas of pristine habitat and the richest of global biodiversity from conversion to agricultural use. Over much of Europe, and most of Britain, however, 6000 years of creation of cultural landscapes since the Neolithic means those pristine habitats have long been a thing of the past. As Bill Bryson (2000) wrote in reference to the English countryside, 'it is one of the busiest, most picked over, most meticulously groomed, most conspicuously used, most sumptuously and relentlessly improved landscapes on the planet'. It has been so for centuries and, as a consequence, the wildlife of Britain, including its bird populations, has long coexisted and coevolved with agriculture. The enduring fascination of its people with natural history, and indeed ornithology (the British Ornithologists' Union celebrated its 150th anniversary in 2008) has ensured that Britain's avifauna and its associations with agriculture are well documented back at least to the eighteenth century (Shrubb 2003). During the twentieth century the rise in support for wildlife conservation and for organisations able to coordinate long-term survey and recording effort, for example the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Wildfowl and Wetlands Trust, means that knowledge of more recent change in bird populations is probably unrivalled anywhere in the world. This rich treasury of data was instrumental in enabling conservation scientists to detect declines in

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bird populations associated with rapid, recent agricultural intensification (Newton 1986; O'Connor & Shrubbs 1986; Potts 1986). Two decades of intensive research effort have followed, directed towards understanding the mechanisms through which agricultural change has caused bird population declines and other biodiversity losses in agricultural systems, and what management solutions might be found. The gradual 'greening' of agricultural policy both in Britain and across Europe as the damaging environmental effects of intensive agriculture and overproduction were recognised, redirected subsidy support to management for environmental goods on farmland. This in turn allowed management measures designed to restore biodiversity, including bird populations, to be tested in agri-environment schemes, on set-aside land and through the growth of organic farming. As a consequence, our understanding of the ecology and conservation of bird populations in modern agricultural systems has increased immeasurably.

This history makes a renewed case study of the relationships between birds and agriculture in Britain timely. Our aim is in part to synthesise the very large and scattered literature that has proliferated since O'Connor & Shrubbs's seminal *Farming and Birds* (1986) reviewed the subject just over 20 years ago. We focus on Britain, but draw extensively on the wider literature, especially from similar temperate agricultural systems and bird communities across Europe, to provide context. Such a synthesis, however, is merely a pause to draw breath. The relationship between birds, wider biodiversity and agriculture in Europe is at a crossroads. The last 20 years of research and development of agri-environment policy and practice have undoubtedly given us an increasingly effective tool kit to help integrate wildlife conservation and productive agriculture in our fine-grained agricultural landscapes. However, globalisation of world markets, continuing growth of human populations and economic aspirations, and the need to both mitigate and adapt to changing climate pose growing challenges. We face a future in which our tool kit will need to grow and change to help us manage agricultural landscapes for a wider range of so-called ecosystem services – for example carbon sequestration and storage, water quality, flood prevention, wildlife conservation and energy generation, as well as food production – and all in a changing climate. To illustrate just how fast things change, as we go to press the European Union announced that the set-aside rate for 2008 should be set to zero, a change that will result in the removal of a huge area of beneficial fallow from the agricultural landscape. At the same time



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rising commodity prices and renewed concerns for food security pose new challenges to environmental management in intensive agricultural systems.

If our work has value, it is perhaps mainly to the extent that it draws attention to the gaps in knowledge that we still need to fill to ensure that diverse and thriving bird populations are maintained as part of agricultural landscapes in meeting these challenges.

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