BIRDS ON THE MOVE

Introducing A Climatic Atlas of European Breeding Birds

RSPB a million voices for nature

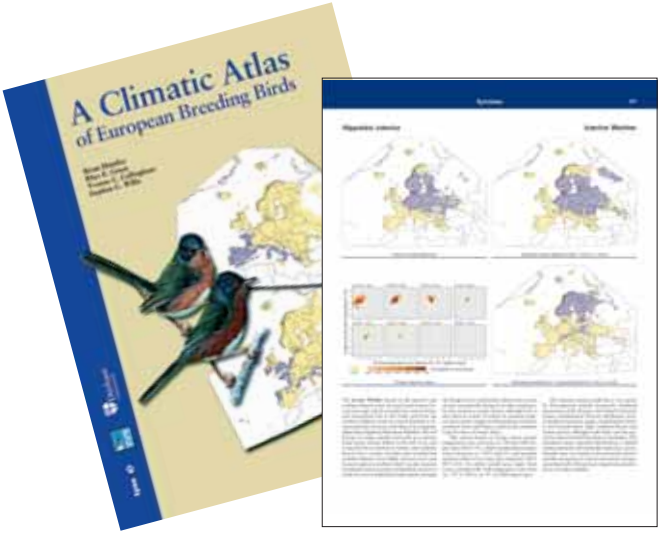
BirdLife INTERNATIONAL

INTRODUCTION

The publication of *A Climatic Atlas of European Breeding Birds* is an important landmark in our understanding of impacts of human-induced climate change on our environment. This short explanatory document, produced by the RSPB (BirdLife Partner in the UK), outlines the key findings of the Atlas, and presents our views about its implications for future climate, conservation and land-use policies.

The Atlas predicts that without vigorous and immediate action to reduce climate change, the potential future range of the average European bird species will shift by nearly 550 km north-east by the end of this century, and will reduce in size by a fifth. More species look set to lose than to gain from projected climatic change. For some species, there is no overlap between their potential future range and their current range; and for a few, there is no future potential range left in Europe. Some bird species that are currently found only in Europe, or that have only small populations elsewhere, are expected to run a significantly increased risk of extinction.

The Atlas has added to the growing body of evidence, telling us that our world and the life it supports are in grave danger from climate change. We must act to reduce the greenhouse gas pollution that is creating this crisis. The RSPB, like the whole global BirdLife Partnership, looks forward to helping our members and supporters make their own lives 'greener', whilst challenging politicians to create the low-carbon economy we need.



But we must also respond to this unprecedented (and partly already unavoidable) threat to nature, with a renewed investment in the natural environment. We must look after our protected areas better, and make them more resilient to the impacts of change. We must create much bigger areas of new habitat, and make the land around them – whether in towns or the countryside – friendlier to wildlife. Our efforts to protect birds and other wildlife from the impacts of climate change now will be rewarded in the years to come, when we look around and see that we have survived the current crisis together. The Atlas is a crucial guide towards planning for the future – now it is up to us to act.

Wallasea Island Ben Hall (rspb-images.com)

Creating new inter-tidal habitat through initiatives such as the RSPB's Wallasea Island Wild Coast Project will help wildlife and people adapt to the impacts of climate change.

Drainage ditch, Wallasea Island
Ben Hall (rspb-images.com)

KEY FINDINGS OF THE CLIMATIC ATLAS OF EUROPEAN BREEDING BIRDS

- The Atlas shows projections of the potential range of European breeding bird species at the end of the 21st century. These are not predictions of actual future range, but show where suitable climate conditions (climate space) are likely to be present.
- The projections are based on the effects of a likely 3°C increase in average global temperature above pre-industrial levels. More or less warming results in projected range changes that are more or less extreme, respectively.
- The centre of the potential future range of the average species is predicted to shift nearly 550 km north-east.
- The potential future range of the average species is about one fifth smaller than the current range.
- For some species, the potential future range does not overlap with the current range at all. The average overlap is 40%.
- Arctic and sub-Arctic birds and some Iberian species are projected to suffer the greatest potential range loss. Projected changes for some species found only in Europe, or with only small populations elsewhere, suggest that climate change is likely to increase their risk of extinction.
- Projected changes in the location and extent of future potential range of individual species vary according to the global circulation model and greenhouse gas emissions scenario used, but the main conclusions are similar.

INTERPRETING THE MAPS: ESSENTIAL CAVEATS

- Climate may not be the dominant factor limiting the recent breeding range of all species. For example, the ranges of several birds of prey have been reduced by human persecution, whilst some seabirds rely on the availability of suitable nesting cliffs.
- Some species may be unable to extend their geographical range immediately into areas made potentially suitable by climate change, because of limited capability to disperse or lack of suitable habitat.
- Fragmentation of suitable habitats because of human land use can also make such dispersal more difficult.
- Range changes can also be delayed because it takes time for suitable conditions to develop, or the necessary habitat is not present.
- Some habitats may persist after conditions are predicted to become unsuitable for their survival. These 'lag times' could allow them to come through a period of climate instability and recover, if greenhouse gas pollution is controlled.

RESPONDING TO THE CHALLENGE

- We must act to curb climate change. Anything above an average 2°C temperature rise risks catastrophic impacts on wildlife.
- We must make wildlife resilient to the impacts of climate change. This will require increased investment in protected areas and the wider countryside, to secure healthy populations – wildlife that is already stressed will be ill-equipped to cope with climate change.
- We must also accommodate expected changes in distribution. More space is needed in which natural habitats can develop or be managed to provide the scope for species to shift their ranges. New habitat is needed both as large blocks and also more widely spread through the countryside to allow species to move more readily between core areas.
- We have many of the instruments we need to help wildlife. In particular, full and imaginative implementation of the EU Birds and Habitats Directives can help wildlife both inside and outside protected areas.

Little egrets Michael Gore (rspb-images.com)

WHAT DOES THE ATLAS SHOW?

The Atlas marks a major advance in understanding of the potential impacts of climate change on wildlife. It combines field data with climate simulation modelling to map the potential geographical ranges of most European breeding bird species at the end of the 21st century. It does this by describing the current breeding range of each species in Europe in terms of three measures of climate: summer warmth, winter cold and water availability. This describes the typical 'climate space' occupied by each species. The Atlas then combines this climate space information with models projecting the late-21st-century climate of Europe, under a moderate greenhouse gas emissions scenario. The results map the potential future range approximately 80 years from now, if global greenhouse gas emissions match this scenario. The potential future range describes the geographical area that is expected to have similar climate characteristics in the late 21st century to those present in the range of the species during the 1980s. It should be kept in mind that other factors, such as habitat availability, might prevent a species from fully occupying this potential future range.

MORE BIRDS AT RISK

The potential future range of the average bird species is predicted to shift nearly 550 km north-east and to be about one fifth smaller than the current range. For some species, the potential future range does not overlap with the current range at all, while the average overlap between the current range and potential future range is 40%. Examples of the Atlas results are given here for Dartford warbler *Sylvia undata* and red/willow grouse *Lagopus lagopus*. Arctic and sub-Arctic birds and some Iberian species are expected to suffer the greatest potential losses of range. Of special concern are range changes projected for some species found only in Europe, or with only small populations elsewhere. For these species, climate change is especially likely to increase their risk of extinction.

INTERPRETING THE MAPS

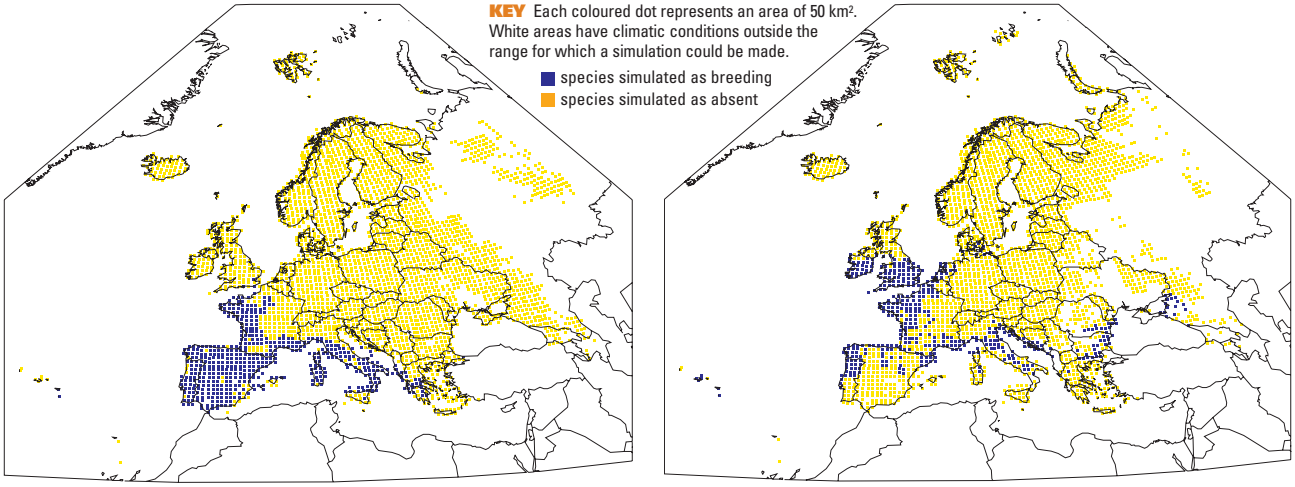
It is important to note that the Atlas reports projections of potential range, not predictions of the actual future range at a particular time. This distinction is important for several reasons. First, all bird species are influenced by climate, either directly or indirectly; but climate is not the only factor influencing bird distribution – habitat availability or hunting pressure can also be important. For example, the ranges of some large species of birds of prey have been reduced from their historical extent by human persecution. In these cases, the part of climate space currently occupied by the species may be more restricted than it could potentially be, and so may not provide an accurate basis for predicting potential future range under climate change. A similar caveat is applicable for species whose ranges are currently limited by lack of habitats that are naturally rare, such as cliffs, or habitats that are rare because of degradation or destruction by human activity, such as large wetlands.

Second, lack of suitable habitat in the potential future range may limit the actual range occupied in the future. This will depend on many factors, most importantly on future land-use patterns and the availability of protected areas in the potential future range.

TIME TO ACT

Species may not immediately come to occupy available habitat in areas with a newly suitable climate. Some species may have limited capability to disperse into newly suitable areas. Fragmentation of suitable habitats because of human land use can make such dispersal even more difficult. Range changes can also be delayed because it takes time for suitable conditions, such as habitat or food availability, to develop. A bird will not be able to change its range before such changes have themselves taken place. This also applies to potential losses of range: for example, it may take many decades for a type of forest required by a bird species to disappear from an area that is no longer climatically suitable. These lags buy crucial time for conservation. Managing habitats to enhance the colonisation of newly suitable areas and to delay or prevent the disappearance of the conditions required by a species will be important methods for reducing the adverse effects of climatic change on ecosystems and wildlife. Premature abandonment of conservation measures for a species at a site identified as a 'lost cause' because of projected climate change may prevent existing populations from producing sufficient colonists to occupy newly suitable areas elsewhere.

DARTFORD WARBLER: PRESENT AND POTENTIAL FUTURE DISTRIBUTION



Simulated distribution in 1961–1990

The Dartford warbler currently breeds in south-west Europe, from Iberia to an eastern limit running from southern England across central France and southern Italy. Outside Europe it breeds only in a narrow strip of coastal north-west Africa, from Morocco to Tunisia. The current range is described very well by climatic conditions, with just a few incorrectly simulated occurrences.

Potential late-21st-century distribution

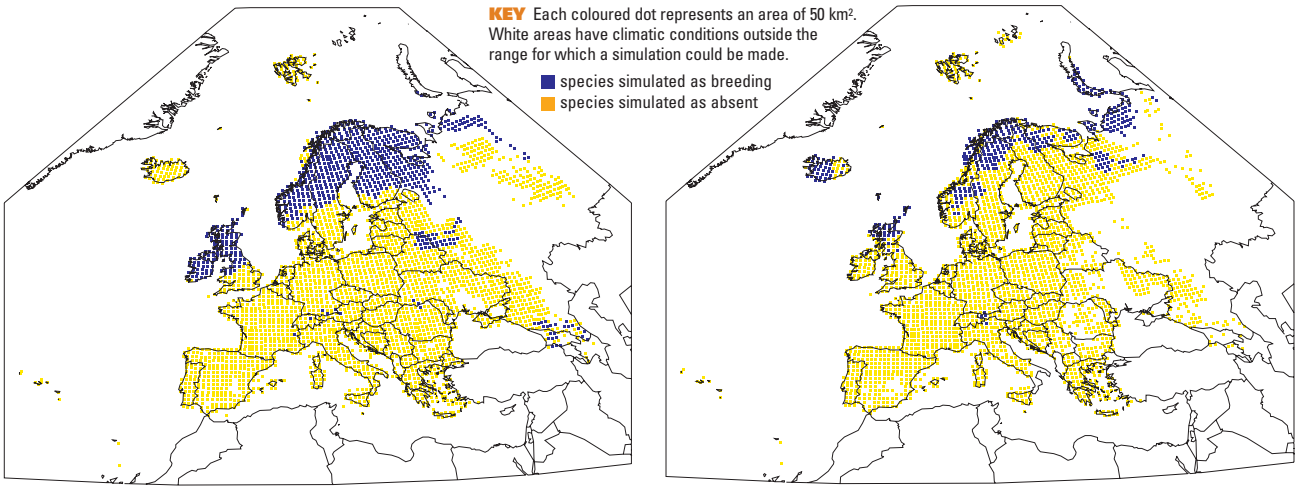
The *potential* future range of Dartford warbler is shifted northwards and eastwards. New areas with potentially suitable climate extend north to include much of the British Isles and western Europe, as well as through the eastern Mediterranean and the Balkans to southern Russia. More than 60% of its present range, however, including much of Iberia and the western Mediterranean, is simulated as no longer suitable.

Dartford warbler Mike Read (rspb-images.com)

CLIMATE CHANGE SIMULATIONS: DEALING WITH UNCERTAINTIES

The maps in the Atlas are based upon simulations of a moderate scenario of climate warming in Europe (a likely 3°C increase in global average temperature above pre-industrial levels by the end of the 21st century). Greater or lower predicted levels of warming result in projected range changes that are similar in direction, but that are more or less extreme, respectively. The use of alternative global circulation models also makes a difference, but the broad conclusions are unaffected. These differences are summarised in the concluding chapters of the book. The degree of warming that we end up facing will have a crucial impact on our ability to conserve species both by management to retain them within their current ranges, and by encouraging their occupation of their potential future range by facilitating movement through the landscape.

WILLOW GROUSE: PRESENT AND POTENTIAL FUTURE DISTRIBUTION



Simulated distribution in 1961–1990

The willow grouse (the endemic British sub-species of which is red grouse) currently breeds across northern Europe, from the British Isles through Fennoscandia to northern Russia. The current range is described very well by climate, with only a few minor discrepancies.

Potential late-21st-century distribution

The potential future range of willow grouse in Europe is shifted north-westwards, with most current breeding localities in the southern half of the present range simulated as no longer suitable.

Red grouse Chris Gomersall (rspb-images.com)

HOW CAN WE HELP WILDLIFE ADAPT?

The Climatic Atlas provides new evidence of the threats to wildlife from dangerous climate change. With this change occurring against a background of habitat loss and fragmentation, pollution and persecution, many species may struggle to survive. A key question is how should nature conservation, and wider public policy, respond to this challenge? The answer, we believe, is a twin-track approach, which protects and restores today's wildlife, and prepares for an uncertain future.

IMPROVING THE HEALTH OF WILDLIFE NOW

Our first task must be to secure healthy populations of birds within their current ranges. Already, almost half the bird species in Europe have Unfavourable Conservation Status because of pressures unrelated to climate change. Many habitats are also degraded or neglected – in the UK, for example, 80% of our blanket bogs have been damaged. We will not be able to manage the threat of climate change unless we tackle these problems first. Central to this will be the extent and quality of our networks of protected areas. Land managed specially for nature conservation offers protection from pollution, persecution and development. There is no evidence that these pressures will lessen as climate change bites; indeed many of them may become more intense. For this reason alone, climate change is likely to increase, rather than decrease the importance of protected areas for wildlife.

PREPARING FOR THE FUTURE

Protecting today's populations will not be enough on its own. Over time, we will need to adjust the management of nature reserves and protected areas to reflect changes in species' distributions. We will be able to do this with much greater confidence if protected areas are expanded and buffered within much larger habitat restoration schemes. Such schemes would provide suitable conditions for existing populations (including the space needed for them to move) and accommodate new species in the future. They would also provide vital services, including carbon storage, flood risk management and water purification. Finally, we will need to make sure that the wider landscape – whether farmed or urban – is 'permeable' to species' movements. We can start by providing stepping stones of high quality habitat and by creating key habitat features in production landscapes – ponds, hedges, ditches, field margins – that offer food and shelter for a wide range of plants, birds and other wildlife.

RSPB Lake Vyrnwy nature reserve Ben Hall (rspb-images.com)

TRIED AND TESTED TOOLS FOR NEW TASKS

We already have many of the tools we need to help wildlife adapt to climate change in Europe, but we must use them more effectively and with renewed vigour. The development of national and international adaptation strategies, with the protection of the natural environment at their core, is an important first step. We must also make full and proper use of the Birds and Habitats Directives and reform land-use policies to secure and improve our network of protected sites, and to help deliver a more resilient and permeable countryside.

We have much to do, and the Climatic Atlas is a warning that we must do it faster, and with more courage. We must cut emissions deeply, and immediately; and we must re-invest in policies to protect and enhance the natural environment. Anything less, and we may find that even if we come through the climate crisis, much of our precious wildlife will not.

WHO HAS WRITTEN AND PUBLISHED THE ATLAS?

The Atlas was written by Professors Brian Huntley (Durham University) and Rhys Green (RSPB and the University of Cambridge), and Doctors Yvonne Collingham and Steve Willis (both Durham University). It has been published by Lynx Edicions in partnership with RSPB/BirdLife International and Durham University. Several other organisations have been closely involved, particularly the European Bird Census Council (EBCC), which co-ordinated the Europe-wide survey of bird distributions used to derive the climate space models.

The Climatic Atlas of European Breeding Birds is not available for purchase from the RSPB, but can be ordered from the publishers:

http://www.hbw.com/lynx/en/lynx-edicions/novedades/ALT0007-climatic-atlas-european-breeding-birds.html

Lynx Edicions, Montseny 8,
E-08193, Bellaterra
Barcelona, Spain

Hoopoe Richard Brooks (rspb-images.com)

The RSPB speaks out for birds and wildlife, tackling the problems that threaten our environment. Nature is amazing – help us keep it that way.

We belong to BirdLife International, the global partnership of bird conservation organisations.

UK Headquarters
The Lodge, Sandy,
Bedfordshire SG19 2DL
Tel: 01767 680551

Northern Ireland Headquarters
Belvoir Park Forest,
Belfast BT8 7QT
Tel: 028 9049 1547

Scotland Headquarters
Dunedin House,
25 Ravelston Terrace,
Edinburgh EH4 3TP
Tel: 0131 311 6500

Wales Headquarters
Sutherland House,
Castlebridge,
Cowbridge Road East,
Cardiff CF11 9AB
Tel: 029 2035 3000

www.rspb.org.uk

BirdLife International is a global Partnership of conservation organisations that strives to conserve birds, their habitats and global biodiversity, working with people towards sustainability in the use of natural resources. BirdLife Partners operate in more than 100 countries and territories worldwide. BirdLife International has 43 Partners in Europe and is active in all of the EU Member States.

http://europe.birdlife.org

BirdLife International
European Division,
Avenue de la Toison d'Or 67,
B-1060 Belgium
Tel: +32-(0)2-2800830

Front Cover image:
Lapwings David Kjaer (rspb-images.com)