

## Population Dynamics Research

**Our 40,000 volunteers collect data from sites across the country that allow us to quantify variation in bird productivity and survival. A unique strength of the BTO is to integrate these data to enable us to build up a detailed picture of the ecology of bird populations, and the factors that cause them to change. Such information can help reverse species declines or lessen the impacts of human actions.**

In particular we organise the British and Irish Ringing scheme, enabling 2,500 volunteers to ring and record over 800,000 birds annually; organise the national Nest Record Scheme, recording the outcome of over 30,000 nesting attempts each year; provide information on population dynamics of a wide range of bird species, particularly those of conservation concern, and; collaborate with biostatisticians to develop and evolve sophisticated analyses of bird population data.



**Please contact to discuss how BTO can help you:**

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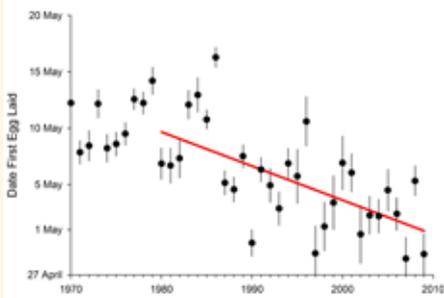
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[www.bto.org/science/population-dynamics](http://www.bto.org/science/population-dynamics)



*'We apply novel statistical techniques to provide a complete picture of the species life-cycle at population-scale'*

### Chaffinches nesting earlier since 1980



### Winter food supplies vital for Yellowhammer



## Understanding Management Actions

Our research is frequently applied to understanding the impacts of developments and land-use interventions on species and habitats. For example, UK estuaries are internationally important for waterbirds that rely on the high densities of invertebrate food species present. For example, Oystercatchers on the Wash rely on cockles and mussels that are also harvested commercially. An analysis of the survival rates in relation to shellfish availability has helped develop a sustainable management strategy for the fishery. Similarly, a study following displaced Redshank in the Cardiff Bay barrage development demonstrated a marked reduction in their survival. These two cases illustrate our rigorous, evidence-based approach.

## Documenting Environmental Change

The environment in which birds live is continually changing. The Nest Record Scheme has shown that many bird species are now nesting up to two weeks earlier than they were 30 years ago. Current research is exploring how the timing of nesting may be starting to be decoupled from peak food supplies. Data from the Ringing Scheme highlighted the importance of winter food supplies for farmland seed-eating birds, the Yellowhammer and Reed Bunting. By understanding how changes in the environment affect survival and productivity of birds, we can document current change and predict how populations might change in the future.

## Integrated Population Analyses

We continue to develop the framework that enables integrated analyses of all our datasets on population dynamics. We apply novel statistical techniques to provide a complete picture of the species life-cycle at population-scale. Such analyses have been influential in understanding the decline of farmland birds, and are beginning to shed light on those of our migratory birds too. Most of the information we generate on bird population dynamics is available on our website ([www.bto.org/birdtrends](http://www.bto.org/birdtrends)) and this provides an important resource for understanding the context of local population changes. A key aim of this work is to provide the best possible information on the status and threats to our bird populations, informing the public and supporting decision-makers.

*Partners: JNCC is the statutory adviser to Government on UK and international nature conservation, on behalf of the Council for Nature Conservation and the Countryside, the Countryside Council for Wales, Natural England and Scottish Natural Heritage.*

## Expertise Brochure

**The British Trust for Ornithology (BTO) is one of the world's leading scientific research organisations specialising in birds and habitats. We are based in Thetford, Norfolk, England, with offices in Scotland, Wales and Northern Ireland.**

We undertake impartial research and analysis, relating to birds, other wildlife and habitats, to advance the understanding of natural systems. The BTO provides high quality, impartial and policy-relevant data and information, relied upon for informed decision making. We work in partnership with the academic and conservation science communities, with Government Departments and Agencies, and with the private and voluntary sectors. The BTO has a unique combination of professional scientists and volunteers, and undertakes modern statistically robust surveys with web-based on-line data entry and retrieval. We add value to data through high powered analysis and a strong modelling capability.



**Please contact to discuss how BTO can help you:**

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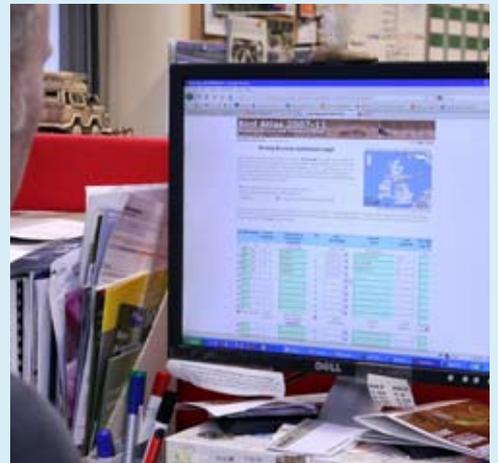
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## BTO Strategy

The BTO has a vision of a world in which nature conservation and sustainable development are founded on evidence-based decision-making, and in which society understands, values and contributes to that process. We are in a time of unprecedented awareness and acknowledgement of environmental change, and the human response to that change must be informed by knowledge and understanding of species and habitats - the ecosystems that underpin our planet's life support. The BTO has a vital role to play in the provision of that knowledge, with citizen science being core to the delivery of the BTO strategy.

## BTO Science Themes

### Monitoring changing bird populations

Our ability to coordinate thousands of motivated and skilled volunteers, together with professional expertise, enable us to track many aspects of birds' lives. We provide facts, figures and indicators that Government and decision-makers use to inform policy, and which is the context for measuring change in our environment.

### Population dynamics and modelling

We integrate records collected by volunteers from many aspects of birds' life-cycles, through nest recording, ringing, and survey monitoring. This integrated population modelling means we are well placed to investigate the effects of environmental change on bird populations.

### Ecosystems: from territories to landscapes

We are at the forefront of land-use issues in ornithology, with unique expertise of studying bird ecology in farmland, woodland, upland and urban habitats at multiple spatial scales. We employ traditional field approaches, innovative technology and state-of-the-art analytical techniques to investigate the consequences of land-use change.

### Migration and the ecology of migrant birds

Understanding the ecology of migration, as birds move between habitats and countries is important if we are to understand the effects of environmental changes at a global scale. Our underpinning knowledge comes from a century of bird ringing and nest recording, and we are now using modern transmitter technology to unravel the ecology of migrant birds.

### Climate change

Climate change impacts on biodiversity become apparent over long timescales, and the BTO's long-term datasets are ideally suited to understanding the underlying processes. We develop indicators and provide advice to Government, international and national bodies to inform policy.

### Wetland and marine research

Inland, coastal and marine waters of the UK all hold internationally important bird populations. BTO is at the forefront of delivering information on waterbirds in response to the requirements of legislation, infrastructure development and policy development. We are actively investigating energy developments offshore.



Black-tailed Godwit being colour-marked as part of an international migration project



Dr Phil Atkinson Head of International Research demonstrating research results to, the BTO's Patron, HRH The Duke of Edinburgh KG KT during a visit to BTO HQ