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Foreword

The long-standing partnership between the statutory conservation agencies and BTO supports many of the bird surveillance schemes currently organised in Britain and Northern Ireland. This report gives an overview of some key results from the second year of the current BTO/JNCC Partnership and it is intended to help you locate more detailed information should you wish to do so.

The work of the Partnership is only possible because of the dedication and hard work of thousands of volunteers who freely give their time and expertise to count birds throughout Britain and Northern Ireland. The BTO and JNCC are greatly indebted to all those who contribute in this way to all the surveys and investigations organised by the Partnership and we would like to record here our sincere thanks for all these good efforts.

At the centre of the Partnership is a suite of long-term surveillance schemes that assess annually the abundance of birds in Britain and Northern Ireland. Together with two additional schemes, funded also by other partners (the RSPB for the Breeding Bird Survey and the RSPB and WWT for the Wetland Bird Survey), this surveillance covers the great majority of breeding and wintering birds with the exception of very scarce species.

The results from different schemes are combined in various ways to give a more complete picture of how bird populations are changing and whether recruitment, survival or movement are responsible for the patterns observed. The web pages for each species under the heading of Breeding Birds of the Wider Countryside Report (www.bto.org/birdtrends) give summaries of their trends and some interpretations of the probable causes.

The work of the BTO/JNCC Partnership is also the basis for much additional surveying and research funded by other organisations, including Defra and other agencies. This further work seeks to investigate some species in more detail and also to discover more about the reasons for the changes observed. Thus, the Partnership is the foundation for an extensive body of research that examines the responses of birds to changing environmental conditions and this enables predictions to be made on the consequences of alternative scenarios for the future of our birds.

The work of the Partnership is reported extensively in technical peer-reviewed scientific journals, other periodicals, books and increasingly via web pages that can be readily accessed via the Internet (www.bto.org). This report includes a list of publications and other outputs from the Partnership to facilitate access to detailed information, analyses and interpretations.

We hope that you find this report informative and a useful link to more detailed and extensive information about changes in bird numbers and some of the causes responsible. If you would like to know more, please explore the BTO and JNCC (www.jncc.gov.uk) websites and then follow the links to the different subject areas.



Dr Nick Carter
British Trust for Ornithology
May 2007



Dr Ian McLean
Joint Nature Conservation Committee

INTRODUCTION

Birds are hugely popular and the public demands their conservation. Ornithology has made an enormous contribution to the advancement of wider nature conservation goals by virtue of this popular support. The value of birds as environmental indicators has been greatly enhanced by voluntary data collection on a wide scale over many years, resulting in the use of bird population trends as one of the Government's headline indicators for sustainable development. Working with volunteers has enabled the development both of extensive and intensive methods of data collection in an extremely cost-effective manner.

This report covers BTO work under the Partnership during 2005/2006, including much collation and analysis of data collected in previous years.

Key results and news from 2005/2006

In the summer of 2005, a highly pathogenic form of avian influenza (H5N1) started to spread across west and central Asia towards eastern Europe. Whilst there was much speculation about the role of wild birds, there were also clear grounds for suspecting that movements of poultry and cage birds were at least partly responsible. However, the cases in western Europe in late winter 2005/06 pointed strongly towards the spread by wild birds following cold-weather influxes of birds from further east. The potential worries about its incursion in Britain led to the formation of an ornithological expert group to advise Defra. The BTO provided much key advice, based on data gathered as part of the BTO/JNCC Partnership, particularly information on migration routes and timing from the Ringing Scheme and on population levels of key waterfowl species from WeBS.

Results from the Breeding Bird Survey (BBS) are critical to the UK Biodiversity Action Plan (BAP) and the Population Status of Birds in the UK, processes. In 2005, the survey showed that populations of some red-listed, BAP species, such as Grey Partridge, Turtle Dove, Spotted Flycatcher and Corn Bunting, have continued to decline (by between 26 and 45%) since 1994. The targets for BAP species were reviewed and updated based on current trends, whether the cause of the decline had been identified and whether conservation management to address the reasons for the decline were in place. BBS trends, in combination with Common Birds Census data and other sources of information, were also used in 2005/06 to produce a list of candidate species in a re-assessment of BAP. This list includes Yellow Wagtail, Willow Warbler and Wood Warbler.

The Government's Entry Level Stewardship Scheme was rolled out in England in 2005, with an aim of improving biodiversity on agricultural land. BBS results will ultimately be key to assessing the success of this scheme. To improve the power to detect changes in numbers of farmland birds over the short term an additional 975 1 km squares of lowland farmland were surveyed in 2005 using BBS methods. These sites will be resurveyed in 2008 and 2011.

BBS data are routinely used to generate a suite of indicators for the UK (the Quality of Life Wild Bird Indicators and the Farmland Bird PSA) and England (the England Biodiversity Strategy and regional wild bird indicators) and Wales (the Welsh Assembly Indicator of birds of farmed habitats). In 2005, BBS data were also included, along with information on trends in widespread farmland and woodland birds from 17 other European countries, to produce Pan-European trends, under the Pan-European Common Bird Monitoring initiative, as reported in the State of Europe's Common Birds 2005. The farmland bird indicator is now an EU Structural Indicator, and hence EU countries are being asked about their capacity to deliver information on the population status of farmland birds.

There were great advances in electronic and online data collection and online information dissemination. Over 90% of ringing data and more than 50% of nest records were submitted electronically. It was the second full year for BBS Online, the development of which was funded by RSPB, and 40% of participants submitted their records by this method. WeBS online went live in 2007 (more details in the next report). The Breeding Birds in the Wider Countryside website, a one-

stop-shop for information about the population status of our common terrestrial birds, was enhanced and updated in May 2006. In it, attention was drawn to the alerts for three species that have recently crossed the 50% decline threshold and may thus be candidates for future editions of the red section of the Population Status of Birds (PSoB) list <http://www.bto.org/psob/index.htm>: Cuckoo (-57%), Willow Warbler (-60%) and Yellow Wagtail (-67%). Two further species may become candidates for joining the amber list: Common Sandpiper (-29% over 25 years) and Lesser Whitethroat (-29% over 25 years).

Such population declines can be driven by changes in productivity and/or survival. Demographic monitoring is a key component of the Partnership programme in understanding the causes of population changes. Four species were added to the Nest Record Scheme's Concern List in 2005 because of newly detected declines in breeding performance for species with declining population trends or uncertain population status: Skylark, Mistle Thrush, Spotted Flycatcher and Starling. It is possible that such declines in breeding performance may indicate environmental problems and might exacerbate population declines or hinder population recovery.

The WeBS Alerts report, updated to include counts for the 2004-05 winter, shows that seven wintering waterbird species have shown declines in Great Britain sufficient to trigger an alert over one or more of the time periods considered. The steepest declines are for European White-fronted Goose and Purple Sandpiper. In Northern Ireland 15 species have exhibited declines sufficient to trigger alerts, with continuing low numbers of Bewick's Swan in the province and no sign of recovery of Pochard or Tufted Duck numbers on Loughs Neagh and Beg.

Land management in the uplands often incorporates controlled burning of vegetation to stimulate growth and to control scrub encroachment. The timing and intensity (how hot the burns are) of burning and the kinds of habitats burnt may influence the extent of wildlife impacts, particularly upon ground-nesting birds, and there are restrictions on how late controlled burning can occur to avoid such problems. Defra and SNH commissioned an analysis of nest record and ringing data to provide information on the breeding periods of birds in the uplands with a view to help the assessment of the potential vulnerabilities of moorland bird populations to current burning practices. The analyses, published in 2005, showed that substantial proportions of the season's nests of some species, such as Golden Plover and Stonechat, are vulnerable to destruction where late burning occurs. Analysis of seasonal variation in breeding performance suggested that losses of nests during April could have impacts on the productivity of Oystercatcher, Peregrine and Wheatear nesting in burned areas and less so for Hen Harrier, Stonechat and possibly Ring Ouzel, even if the birds could relay. The report was considered as part of Defra's science panel that reviewed the whole area of muirburning.

Thanks to volunteers

We are grateful to the many volunteers who contribute so much to the conservation of wildlife in the UK by participating in the BTO/JNCC work programme. The time they spend on fieldwork alone is the equivalent of many hundreds of full-time staff. We particularly thank the BTO Regional Representatives who, also in a purely voluntary capacity, organise the fieldwork at a local level.

Thanks to land owners and managers

We would also like to thank all of the farmers, land owners and managers, who have been supportive of our work, especially in allowing volunteers ready access to their land.

The Partners

The Joint Nature Conservation Committee (JNCC) is the forum through which the three Country Nature Conservation Agencies, the Countryside Council for Wales, English Nature and Scottish Natural Heritage, deliver their special statutory responsibilities for Great Britain as a whole and

internationally. These responsibilities, known as special functions, contribute to sustaining and enriching biological diversity, enhancing geological features and sustaining natural systems. For the purposes of the Partnership with BTO, JNCC also represents the Environment and Heritage Service Northern Ireland.

The special functions are: to devise and maintain common standards and protocols for nature conservation; to promote, through common standards, the free interchange of data between the country agencies and with external Partners; to advise on nature conservation issues affecting Great Britain as a whole; to pursue wider international goals for nature conservation (encouraging sustainable development, biological diversity and earth science conservation), including the provision of relevant advice to the Government; and to commission new research and collate existing knowledge in support of these activities, and to disseminate the results.

The British Trust for Ornithology (BTO) promotes and encourages the wider understanding, appreciation and conservation of birds. A key element of BTO's approach is the synergistic combination of unpaid contributions of the time and expertise of over 30,000 members and volunteers, with the professional skills of trained staff.

In pursuit of its aims, the Trust seeks to: conduct high-quality, impartial research in field ornithology; provide scientific evidence and advice on priority issues in bird conservation; and base this work on a partnership between amateurs and professionals, conducting fieldwork that is both enjoyable and scientifically rigorous.

Co-operation between JNCC (and its predecessor bodies) and BTO has been long and particularly fruitful. JNCC and the country agencies have used data and information collected by thousands of BTO members to promote the conservation of sites and habitats of importance for bird conservation throughout Britain, as well as to highlight the specific needs of individual species. More detailed research has been undertaken to investigate conservation problems and to suggest solutions.

As well as applying the results generated by BTO, JNCC contributes its conservation expertise to the Partnership, thus helping to ensure that the work addresses priority issues. BTO contributes not only the fieldwork of the volunteers but also both the ornithological and ecological expertise of its staff and members and the experience that it has of organising large-scale surveys, collating the data, and analysing the results. Both Partners contribute to the costs.

The BTO/JNCC Partnership overlaps with Partnerships responsible for the Breeding Bird Survey (with RSPB) and the Wetland Bird Survey (with WWT and RSPB).

PROGRAMME 1: LICENSING

Background

The individual Country Agencies have statutory responsibility for the licensing of ringing activities within their countries. They have related responsibilities for licensing the visiting of nests of species on Schedule 1 of the Wildlife and Countryside Act 1981 for the purpose of ringing and nest recording. The Country Agencies allow the BTO to issue permits on their behalf to suitably qualified ringers through a system of a delegated organisational licence issued to the BTO. As part of this procedure the Country Agencies require the BTO to produce reports on the numbers of licences for different activities issued.

There are three categories of BTO ringing permit: A (fully independent); C (limited independence); and T (training, operating under direct supervision only). All permits expire on the 31 March each year but the renewal period is staggered to spread the process.

Objectives

To operate a fair and strict licensing system to ensure that birds are ringed safely in accordance with high standards to ensure their welfare and to ensure that nests are recorded without harming the birds concerned.

Key Results

The number of licensed ringers in the UK has gradually increased since 1998. Only in Wales has there been no growth over the seven years, although there was a small decline in the number in Northern Ireland in 2005.

Table 1. Total Numbers of The Three Types of Permit Issued, by Country of Residence of Ringer, in 1998 (first year of previous agreement), 2003 and 2004 (first year of new agreement)

	ENGLAND	SCOTLAND	WALES	N IRELAND	TOTAL
1998	1,409	318	106	47	1,880
2003	1,505	327	105	52	1,989
2004	1,535	329	106	51	2,021
2005	1,554	335	107	49	2,045

Unconventional methods = 222

Schedule 1 licenses = 402

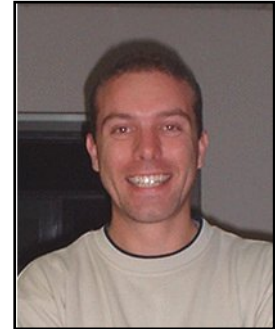
The number of ringers with cannon-net endorsements has decreased slightly over the period, from 47 in 1998 to 43 in 2003, 2004 and 2005, following a five-year review in 2002/03. The number of licences to use unconventional marks and methods has increased rapidly from 86 in 1998 to 150, 195 and 222 in 2003, 2004 and 2005 respectively. The number of licenses for disturbing species on Schedule 1 after remaining relatively stable over the period, at 362 in 1998 and 379 and 369 in 2003 and 2004, respectively has now increased to 402.

Key Events

Jez Blackburn has taken over responsibility for ringing sales as well as licensing.

Further Sources of Information

Blackburn, J.R. 2006. *Report of the British Trust for Ornithology to JNCC on Licences Issued during 2005*. British Trust for Ornithology, Thetford.
See website: <http://www.bto.org/ringing/ringinfo/become-a-ringer.htm>



Contact Point

Jez Blackburn is the Licensing and Sales Team leader in the Ringing Unit of the Populations Research Department. Email: ringing@bto.org.

PROGRAMME 2: SURVEYS OF BRITISH NON-BREEDING WATERBIRDS

Wetland Bird Survey

Background

The UK supports internationally important numbers of non-breeding waterbirds. In line with the requirements of international conservation Conventions and Directives, the Wetland Bird Survey (WeBS) has been designed to provide the principal data for the conservation of these birds and their habitats. WeBS data are also used in updates of the Population Status of Birds in the UK and State of the UK's Birds (www.bto.org/research/pop_trends/state_uk_birds.htm). The Wetland Bird Survey is a four-way partnership between BTO, WWT, RSPB and JNCC, the last on behalf of the individual country agencies. The day-to-day running of the Wetland Bird Survey, which includes the WeBS Low Tide Count scheme and the WeBS Alerts programme, is undertaken by the BTO.

Objectives

Wetland Bird Survey Core Counts – to assess the size of waterbird populations, determine trends in numbers and distribution, and assess the importance of individual sites for waterbirds.

Wetland Bird Survey Low Tide Counts - to count waterbirds using defined sectors of intertidal habitat on major estuaries at low tide, and to assess the relative importance of different areas for feeding birds.

Wetland Bird Survey Alerts – to describe, in a standardized manner, the direction and magnitude of changes in waterbird numbers, at a variety of spatial and temporal scales. These “Alerts” are intended to be advisory and, subject to careful interpretation, to provide a platform from which to direct research and subsequent conservation efforts.

Methods

Wetland Bird Survey Core Counts – Volunteers make counts of defined wetland sites on a monthly basis, mostly within the period September to March although many counters provide data year-round. Counts are conducted for all waterbirds present, although counting of gulls and terns is optional at the discretion of the counter.

Wetland Bird Survey Low Tide Counts - Volunteers count waterbirds each month between November and February on pre-established areas of the intertidal habitat in the period two hours either side of low tide.

Wetland Bird Survey Alerts - Raw counts are first converted into annual indices (using counts from those months in which wintering numbers of the particular species are most stable). A smoothed line is fitted through the indices using a 'Generalised Additive Model' (or GAM), a specialised statistical technique. Changes in numbers are then calculated using values from the smoothed trend. The Alerts process assesses the change in numbers over short-, medium- and long-term periods (5, 10 and 25 years, respectively). Increases or decreases in the smoothed trend are calculated as the proportional change over the relevant time period and are categorised according to its magnitude and direction: thus, declines of between 25% and 50% trigger Medium Alerts and declines of greater than 50% trigger High Alerts.

Key Results

WeBS Core Counts

The counts up to the end of the 2004-05 winter have been analysed and the findings are summarised in the annual report, *Waterbirds in the UK 2004-05* (published 2006).

<http://www.bto.org/survey/webs/webs-downloads.htm>. WeBS counters covered 3,300 count sectors at around 2,000 count sites. Species exhibiting particular declines included both European and Greenland White-fronted Geese, Shelduck (Great Britain), Mallard, Great Crested Grebe (Northern Ireland), Coot (Northern Ireland), Ringed Plover, Grey Plover and Bar-tailed Godwit. Conversely, some species are currently exhibiting upward trends, including Whooper Swan, Pink-footed Goose, Icelandic and re-established populations of Greylag Goose, Egyptian Goose, Shelduck (Northern Ireland), Golden Plover, Black-tailed Godwit and Greenshank. The decline in the numbers of wintering Dark-bellied Brent Goose appears to have been reversed. A key feature of recent WeBS counts has been the dramatic decline of some diving duck species in Northern Ireland, due largely to trends in numbers using Loughs Neagh & Beg. The data for 2004/05 showed sustained low numbers of Pochard and Tufted Duck. However, Scaup peaked at their highest ever level, showing that previous concerns may have proved unnecessary.

WeBS Low Tide Counts

During the winter of 2004/05, WeBS Low Tide Counts took place on a total of 21 estuaries, including Rough Firth for the first time within this scheme, as well as repeat counts of significant sites such as the Medway Estuary, Langstone Harbour and the Solway Firth. In total, around 110 volunteers surveyed over 30,000 ha of coastline with over 350,000 waterbirds counted. The 2004-05 surveys will be summarised in *Waterbirds in the UK 2004-05 The Wetland Bird Survey*. 2006. BTO/WWT/RSPB/JNCC, Thetford.

<http://www.bto.org/survey/webs/webs-downloads.htm>. The following year, in 2005-06, an innovation was the investigation of low tide distribution of waterbirds in Morecambe Bay using aerial survey, using additional financial support from English Nature (Banks *et al.* 2006).

WeBS Alerts

The WeBS Alerts Report for 2003/04 was published online (<http://blx1.bto.org/webs/alerts/index.htm>) and was updated with the 2004/05 report in winter 2006

<http://www.bto.org/webs/alerts/alerts/index.htm> We are now reporting on the Alerts status of every statutory site annually, instead of every third year as originally envisaged. This includes several new English SSSIs of interest identified by a review carried out for English Nature. This is in addition to continuing to report on trends at national levels for all species.

Key Events

During 2005/06, extensive work was carried out on the WeBS Database, GIS functions (Count Unit Definition Inventory) and in preparation for WeBS Online. Annual reports were published for 2003/04, as well as the outstanding joint report for 2001/02 and 2002/03. WeBS also had a separate presence at the Rutland Bird Fair to help to promote the scheme and to meet existing counters.

Further Sources of Information

Websites:

General: <http://www.bto.org/survey/webs/index.htm>

Low Tide Counts: <http://www.bto.org/survey/webs/webs-ltc.htm>

WeBS Alerts: <http://blx1.bto.org/webs/alerts/index.htm>

Latest published reports:

Banks, A.N., Ellis, P., Holloway, S.J., Holt, C., Horner, R., Maclean, I.M.D., Marchant, J., Musgrove, A.J., Schofield, R.A., Sheldon, J. & Stenning, J. 2006. Surveying Waterbirds in Morecambe Bay for the Wetland Bird Survey (WeBS) Low Tide Count Scheme. BTO Research Report No. 443, British Trust for Ornithology, Thetford.

http://www.bto.org/research/reports/researchrpt_abstracts/2006/rpt_443.htm.

Collier, M.P., Banks, A.N., Austin, G.E., Girling T., Hearn, R.D. & Musgrove, A.J. 2005. *The Wetland Bird Survey 2003-2004: Wildfowl and Wader Counts*. BTO/WWT/RSPB/JNCC, Thetford.

<http://www.bto.org/survey/webs/webs-downloads.htm>.

Musgrove, A.J., Langston, R.H.W., Baker, H. & Ward, R.M. (Eds.) 2003. *Estuarine Waterbirds at Low Tide: The WeBS Low Tide Counts 1992-93 to 1998-99*. WSG/BTO/WWT/RSPB/JNCC, Thetford.

Contact Point

Dr Andy Musgrove is WeBS National Coordinator at the BTO.

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PROGRAMME 3: SURVEYS OF BRITISH TERRESTRIAL BIRDS

Breeding Bird Survey

Background

The status of wild bird populations is an important indicator of the health of the countryside. In 1994, after two years pilot work, the BTO/JNCC/RSPB Breeding Bird Survey (BBS) was launched, with the aim of improving the geographical scope of UK bird monitoring by including all habitats, and, therefore, more species of breeding birds than the previous Common Birds Census (CBC). Since the final year of the CBC in 2000, the BBS has become the primary scheme for monitoring the population changes of our common and widespread bird species in the UK. More than 2,000 sites are surveyed each year allowing the population trends for 100 species to be generated for the UK. The methodology for



*BBS is tracking the spread and increase of numbers of Buzzards.
Photo: John Harding*

producing long-term joint CBC/BBS trends for about 70 species was developed under the BBS programme. These results are published annually on the BTO website, and BBS results also contribute to the Pan-European Common Bird Monitoring initiative funded by the RSPB and the EU. BBS data are important for updates to the UK Biodiversity Action Plan (BAP), Population Status of Birds in the UK and State of the UK Birds 2005 (www.bto.org/research/pop_trends/state_uk_birds.htm).

BBS data are also used in various research and conservation projects, including the development of maps of relative abundance, for estimating national population sizes, and for determining the influence of changes in land management.

Objectives

To provide population trends for a range of common and widespread, mainly terrestrial, birds in the UK.

Methods

The BBS uses a line-transect method in randomly selected 1km squares. Each surveyor visits their plot twice within the breeding season, walking two 1km transects across their square and recording all birds seen or heard. Birds are recorded in one of three distance bands, to allow species density to be calculated and detectability to be assessed, or in flight. A separate visit is made to record habitat. A large proportion of surveyors also record mammals in their bird transects.

Key Results

A total of 221 species and subspecies was recorded in 2005 in a record total of 2,879 squares. This compares with 219 species in 2,512 squares in 2004. Twenty-two species declined and 51 increased significantly between 1994 and 2005 (<http://www.bto.org/bbs/results/BBSreport05.pdf>). The remaining species showed no significant change in abundance. Table 2 shows the species that either declined or increased during this eleven-year period.

Key Events

This was the second full season that BBS-online, the development of which was funded by the RSPB, was operating and 40% of participants submitted their records by this method. BBS Online allows observers to submit their BBS records electronically via the web, manage their data, view results of the BBS and download reports (see website address below).

Counts of mammals recorded by BBS participants were analysed to produce population trends for seven species, and information on an additional six species were used to assess their population status (Newson and Noble 2006). See also the UK Tracking Mammals Partnership (www.trackingmammals.org).

Table 2. Declining and Increasing Populations of Bird Species in 1994-2005.

Declining >50%	Declining 25-50%	Increasing >50%
Wood Warbler Willow Tit	Grey Partridge Curlew Turtle Dove Tree Pipit Yellow Wagtail Whinchat Lesser Whitethroat Spotted Flycatcher Pied Flycatcher	Little Grebe Greylag Goose Canada Goose Shelduck Red-legged Partridge Buzzard Coot Great Spotted Woodpecker Grey Wagtail Stonechat Grasshopper Warbler Blackcap Goldcrest Nuthatch Raven
	Corn Bunting	

Key:

Red = Species of High Conservation Concern (Red Listed)

Orange = Species of Medium Conservation Concern (Amber Listed)

Taken from - Population Status of Birds in the UK: Birds of Conservation Concern 2002-2007

<http://www.bto.org/psob>

Further Sources of Information

Raven, M.J. & Noble, D.G. 2006. The Breeding Bird Survey 2005. BTO Research Report 439, British Trust for Ornithology, Thetford. <http://www.bto.org/bbs/results/BBSreport05.pdf>.
www.bto.org/bbs/results/latest_results.htm

Newson, S.E. & Noble, D.G. 2006. The production of population trends for UK mammals using BBS mammal data: 1995-2004 update. BTO Research Report 404, British Trust for Ornithology, Thetford. www.bto.org/bbs/research/reports_papers.htm

Website: www.bto.org/bbs

Contact Points

Dr David Noble is the Head of the Census Unit, in the Populations Research Department, and oversees the running of the BBS and other bird surveys.

Mike Raven is the National Organiser for the BBS and is responsible for its day-to-day running.



Dr David Noble

PROGRAMME 4: NATIONAL RINGING SCHEME

Numbers of Birds Ringed and Recovered in 2004 and Research

Background

Much has been discovered about birds by watching and counting them, but such methods rarely allow birds to be identified as individuals. This is essential if we are to learn about how long they live and when and where they move, questions that are vital for bird conservation. Placing a lightweight, uniquely numbered, metal ring around a bird's leg, provides a reliable and harmless method of identifying birds as individuals. Each ring carries an address so that anyone finding a ringed bird can help by reporting its whereabouts and fate. Some ringing projects also use colour rings to allow individual birds to be identified in the field. Information from the National Ringing Scheme is used in the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

Methods

Birds are caught for ringing in a variety of ways. About twenty percent are ringed as chicks in the nest; this is valuable because their precise age and origin are then known. The method most frequently used to catch fully-grown birds is mist-netting, where a fine net is erected between poles and this traps birds in flight. This method is very effective but birds can only be removed safely from mist-nets by experienced ringers, who have received special training.

Objectives

The primary aim of the Ringing Scheme is to contribute to our understanding of population changes by monitoring the survival rates, productivity and dispersal of a wide range of species. The Ringing Scheme places increasing emphasis on the development of planned projects following specific study designs. The Scheme also makes an important contribution to our knowledge of bird movements, particularly through analyses of ring recoveries. The Ringing Scheme also aids other aspects of basic science, particularly studies of life history strategies, moult, condition and taxonomy.

Key Results

2004

The number of birds ringed (8,881,920) was the highest ever and was 18% higher than the mean for the previous five years. The recovery total of 11,930 was also high and was 9% higher than the mean for the previous five years. Recoveries of particular note again included some from expanding species. The six reports of five individual Little Egrets bring the total number of recoveries of this species from BTO ringing to eight. There were also six reports of three individual Great White Egrets, all ringed in the same area of France (see map). The seventeenth recovery of a BTO ringed Egyptian Goose was received during the year. Although this introduced species is also expanding, all the recorded movements have been quite short. There are many reports of Blackbirds each year, but few are unusual. However, a colour-ringed bird from Norfolk has been seen in Devon in two winters and appears to be making a regular migration. This bird has been the subject of much publicity, which has been beneficial to the Ringing Scheme. At the other end of the scale, only 745 Aquatic Warblers have been ringed in Britain & Ireland and there has been just one recovery – a bird that moved from Sussex to Kent in 1995. However, 2004 saw the third report of a foreign-ringed Aquatic Warbler. The bird was ringed in Belgium on 10 August 2003 and recaptured in Glamorgan just four days later. The other two records are both of birds ringed in Poland in 1990 and also recaptured in 1990 (in Avon and Cornwall).



Movements of Great White Egrets ringed at Lax du Grand-Lieu and reported in Britain & Ireland. Lines join reports of one individual. The ringing site in France is indicated by a star.

Work was carried out during the year on the relationship between survival and winter weather. We looked at changes in survival from reports of dead birds for ten resident passerines from 1966 to 2000. Survival was related to the North Atlantic Oscillation (a good general measure of overall weather conditions) in five species. Duration of winter frosts, occurrence of cold, wet days and of snow days, spring temperature and summer drought were also related to survival in particular species. The importance of different factors was related to the foraging strategy of the species.

Work on recoveries (reports of ringed birds) has showed that the rate at which birds are reported has declined across virtually all taxonomic groups. This suggests that changes in reporting (or finding) behaviour are at least partly responsible for the decline, perhaps because people are less willing to write letters. Web site reporting and the addition of a web address to some rings are tackling this problem. Some differences between different groups of birds do suggest other reasons for change. For example, reporting rates of resident passerines have particularly declined. This might reflect differences in ringing (more birds being ringed away from human habitation), reporting behaviour (an increased perception that these birds do not migrate and are therefore ‘uninteresting’) or some change in the birds’ behaviour. Further analysis should help distinguish between these effects.

There is much concern globally over declining populations of waders, especially those that breed in Arctic areas, which are particularly threatened by climate change. Monitoring these species on their breeding grounds can be difficult as they are remote, there are few people in the area and the birds breed at low density. Monitoring is therefore easier on the non-breeding grounds and a paper was produced during the year to provide advice on the monitoring of non-breeding waders.

Recovery data for 26 species were supplied to 13 ornithologists to assist with their research. Summaries of recoveries relating to all species ringed or recovered in Lancashire and Leicestershire were also supplied. Biometric data for one species were supplied to one researcher as was moult data for one species. CES data were supplied to five researchers. A list of publications resulting from the analysis of recoveries and other studies involving ringing is included below. In 2004, 35 papers by non-BTO staff were published that used ringing data.

Key Events

In 2005 over 90% of ringing data were submitted electronically by ringers and 50% of all recoveries (nearly all of those sent in by ringers) were submitted electronically.

Members of the public were able to use a web form to report recoveries (a multilingual form developed by BTO on behalf of EURING for use throughout Europe) – nearly 2,800 reports were received in this way in 2004 and over 2,000 in 2005.

Ringling totals were the highest ever, partially a continued reflection of the decrease in ring prices at the end of 2002.

Requests to ringers for ringing details of birds that have been recovered but for which ringing details have not yet been received were sent out by email (previously all sent by post).

Further Sources of Information

Clark, J.A., Robinson, R.A., Balmer, D.E., Blackburn, J.R., Grantham, M.J., Griffin, B.M., Marchant, J.H., Risely, K. & Adams, S.Y. 2005. Bird ringing in Britain and Ireland in 2004. *Ringling & Migration* 22: 213-253. http://blx1.bto.org/pdf/ringmigration/22_4/ringreport.pdf

Kew, J. & Kew, A. 2005. CL98725 – a remarkable Blackbird. *Ringers' Bulletin* 11: 74.

Robinson, R.A., Clark, N.A., Lanctot, R., Nebel, S., Harrington, B., Clark, J.A., Gill, J.A., Melfoite, H., Rogers, D.I., Rogers, K.G., Ens, B.J., Reynolds, C.M., Ward, R.M., Piersma, T. & Atkinson, P.W. 2005b. Long term demographic monitoring of wader populations in non-breeding areas. *Wader Study Group Bulletin* 106: 17-29.

Website: www.bto.org/ringing

Ringling and Migration website: www.bto.org/ringing/rmj

Ring reporting form: www.ring.ac

Contact Point

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Email: ringing@bto.org



PROGRAMME 5: BIRD SURVIVAL AND MOVEMENTS

Population Dynamics

Background

Information on changes in abundance, changes in productivity and changes in survival rates can be drawn together as part of the Integrated Monitoring Programme to help understand the demographic and environmental causes of population change. This then helps to inform the Partnership about where future conservation action and research might be focussed.

Programme 5 also includes the organisation and running of two ringling programmes: RAS (Retrapping Adults for Survival) and CES (Constant Effort Sites). RAS is a relatively new scheme that aims to provide data for the analysis of survival rates for species for which ringling recoveries provide insufficient data for the production of annual estimates. CES provides information on annual population changes as well as survival rates and breeding success for species in scrub and reed habitats.

Objectives

Three research elements were included in the programme of work: (a) development of methods for the large-scale analysis of survival rates from CES data; (b) the analysis of survival rates of at least 8 species based on RAS data; and (c) commencement of the development of methods for the

measurement of variation in the length of the breeding season, using ringing and nest record data; to be completed in 06/07.

Methods

Because many individual birds are caught multiple times on CES sites, these sites provide an ideal opportunity to measure adult survival rates. Juvenile survival rates are difficult to estimate, because mortality cannot be separated from dispersal away from the site (which may be significant); adult birds tend to return to the same site each year. Because of the number of sites involved in CES (over 300 have contributed since its inception in 1983), we have had to develop new statistical techniques to ensure estimation of all parameters. These are based on standard mark-recapture methods, but have been modified to take into account the presence of transient birds, i.e. those birds which are only present on the site temporarily (perhaps because they are passing through on migration).

We can also estimate adult survival rates for species that are the subject of RAS studies using standard mark-recapture models. On RAS sites ringers aim to ring all adults breeding on the site. From the pattern of recaptures between years we can estimate the survival rate each year.

Key Results

Annual estimates of survival rates were developed for two species, Bullfinch and Reed Warbler. The former occurs widely, but in relatively low numbers, the latter at a few sites, but in good numbers. It was possible to estimate annual survival rates in both cases, which showed that while survival of Reed Warblers had remained constant, survival of adult Bullfinches has gradually declined, probably contributing to the population decline in this species on CES sites.

For RAS studies, it was possible to estimate survival rates for eight species: Barn Swallow, Sand Martin, House Martin, Pied Flycatcher, Willow Warbler, Tree Sparrow, Wheatear, Whinchat and Blackbird, though only for the first four of these were more than one site available. These results are discussed further under the RAS project summary below.

Key Events

Draft papers are in preparation describing both the CES and RAS survival results.

Further Sources of Information

Website: www.bto.org/survey/ipm.htm.

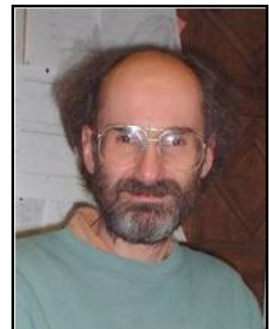
Popular report: Freeman, S.N., Balmer, D.E. & Robinson, R.A. 2005. Survival rates from CES ringing. *BTO News* 256: 20.

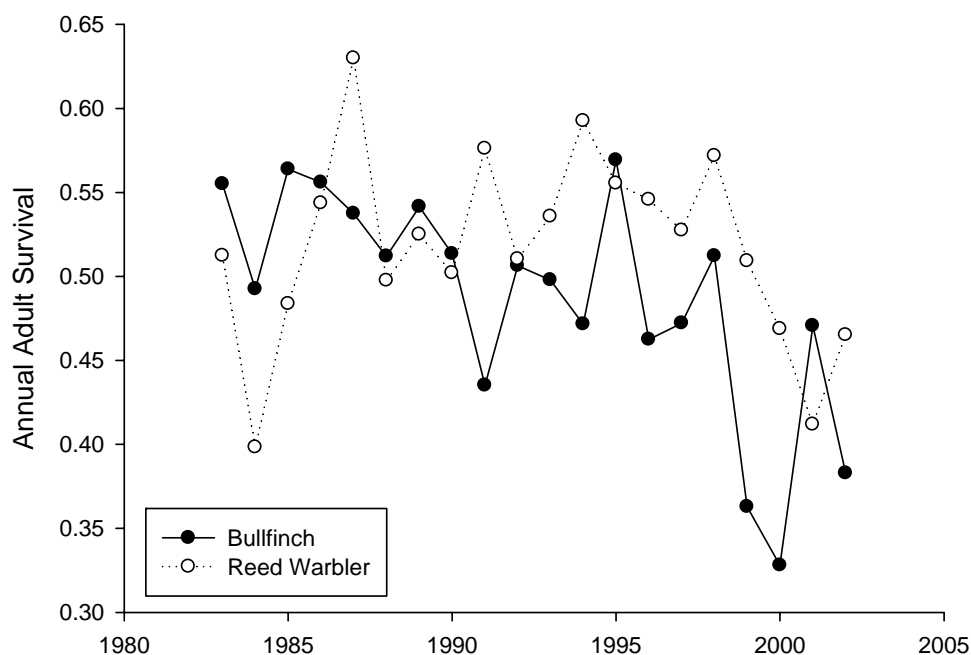
Previous analytical methods: Peach, W.J., Crick, H.Q.P. & Marchant, J.H. 1995. The demography of the decline in the British Willow Warbler population. *J. Appl. Stat.* **22**: 905-922.

Contact Point

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Annual adult survival rates for Bullfinch and Reed Warbler from CES sites.

Constant Effort Sites Scheme

Background

The Constant Effort Sites (CES) scheme was the first national standardised ringing programme within the BTO Ringing Scheme and has been running since 1983. Ringers set their nets in the same pattern, for the same time period at regular intervals through the breeding season at around 120 sites throughout Britain and Ireland.

Objectives

The scheme provides valuable key information on (1) changes in population size, (2) changes in breeding success and (3) adult survival rates for 25 species of common songbird. The scheme provides such information from habitats that are not well covered by other schemes, particularly reedbeds and lowland scrub.

Methods

The CES scheme uses catches from standardised mist-netting to monitor key aspects of the demography of 25 common breeding songbirds. At around 120 sites throughout Britain and Ireland, dedicated ringers erect mist-nets in the same positions and for the same length of time, during twelve visits spread between early May and late August each year. Changes in the total number of adults caught provide a measure of changing population size, while the proportion of young birds caught forms an index of breeding success. Retraps of adult birds ringed in previous years are used to estimate annual survival rates. The ringers also collect detailed habitat information about their sites

every three years. We have begun developing a methodology to enable the routine production of annual adult survival rates.

Key Results

A total of 113 sites were covered in the 2005 breeding season, a slight drop on the number covered in 2004. Coverage after the Foot and Mouth outbreak in 2001 has still unfortunately not yet returned to the record level of 147 sites in 2000. The majority of sites are located in reedbeds, wet and dry scrub and a small number of sites in deciduous woodland.

There were statistically significant increases in the numbers of adults caught between 2004 and 2005 for six species: Wren, Robin, Blackcap, Blue Tit, Great Tit and Chaffinch. Interestingly, all of these species (except Chaffinch) showed statistically significant increases in productivity in the previous season, presumably leading to an inflated population level. Chaffinch productivity had also increased, but not significantly.

The three species showing a statistically significant decline in the number of adults caught between 2004 and 2005 (Sedge Warbler, Reed Warbler and Whitethroat) were all trans-Saharan migrants. Non-significant declines were also recorded for two of the three other long-distance migrants (Lesser Whitethroat and Willow Warbler), and this possibly signifies poor conditions in the wintering areas or on migration.

Following a year of relatively high productivity in 2004, only two species (Greenfinch and Linnet) showed a statistically significant increase in productivity. Both of these are multi-brooded species and presumably were more able to tolerate the unsettled summer weather.

Eight species showed a statistically significant decline in productivity between 2004 and 2005 (Whitethroat, Blackcap, Long-tailed Tit, Blue Tit, Great Tit, Treecreeper, Chaffinch, and Reed Bunting). The declines in productivity in the resident species may be due to increased numbers of adults in the population, but also due to very unsettled weather during the breeding season.

Recent work on calculating adult survival rates from CES data has been used to show a slow decline in the survival of adult Bullfinch since 1983. The UK population has declined by 50% since 1967, and CES has also shown a 17% decline in adult abundance and a 7% decline in juvenile abundance since 1984.

Key Events

CES News published in spring 2005

CES meeting at the BTO Annual Conference, December 2005

Further Sources of Information

Website: www.bto.org/ringing/ringinfo/ces

Popular Report: Balmer, D.E. 2005. CES now monitoring Cetti's Warbler. *BTO News* 257: 4-5.

Contact Point

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Retrapping Adults for Survival

Background & objectives

Retrapping Adults for Survival (RAS) uses recaptures of adult birds, and resightings of colour-marked individuals, to calculate the proportion that survive between breeding seasons. Targeted retrapping and resighting of marked individuals within RAS's set study areas enables adult survival to be estimated much more precisely than by using general ringing capture data, especially for species that produce few ring recoveries.

RAS aims to provide information on adult survival for a range of species, particularly those of conservation concern and those not well monitored by other BTO ringing, in a variety of locations.

Methods

An individual ringer or a group of ringers choose a species and a study area. They aim to use ringing to identify individually all of the adults (or all adults of one sex) of their chosen species in the study area each year. Species targeted for RAS projects need to show a high fidelity to breeding sites from year to year, so that the non-appearance of an individual bird is likely to mean it has died rather than moved away from the study area. For some species, such as Eider, is it appropriate to restrict the project to females only. Each RAS project should run for at least five years, but preferably much longer, so that annual survival rates can be monitored long term. The site-fidelity and longevity of the study birds, together with the project's recording efficiency, determine how many adults need to be caught each season to produce a valid survival estimate. Inevitably, for various reasons, not every RAS project can provide enough data each year for an annual survival rate to be calculated.

Key results



Pied Flycatcher is the most commonly selected species for RAS studies.

Photo: Tommy Holden

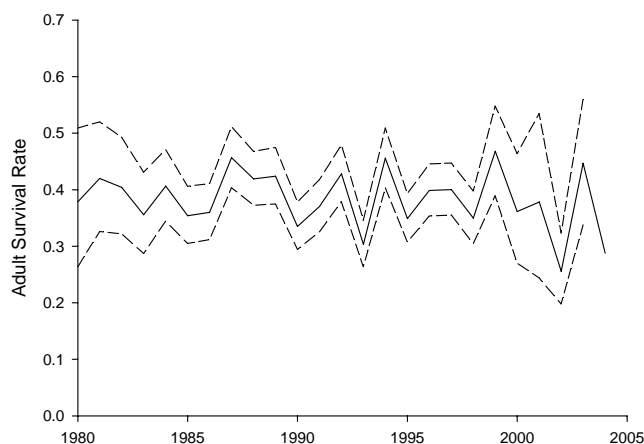
Annual samples for past years tend to creep upwards: this is because some submissions fail to meet reporting deadlines, and because newly registered projects often come with a few years' back data. The present figure of 103 projects active in 2005 is low, compared with RAS's peak sample of 122 projects achieved in 2004, but is expected to grow. Projects dropping out of the scheme are often those where it has proved impractical to catch enough birds.

In 2005 there were 17 studies for Pied Flycatcher, 16 for Sand Martin, 6 for Swallow, and five each for House Sparrow and Reed Warbler. All but three of the Pied Flycatcher projects pre-dated the formal start of RAS in 1998 (one by 30 years), and overall the average duration was a spectacular 19 years each. Of ten new projects registered for a 2005 or 2006 start, four were for House Sparrow (red-listed) and three for Sand Martin (amber).

The spring newsletter reported new studies of annual survival rates for Pied Flycatchers and hirundines. For the former, fluctuations but no trend in survival rate since 1980 suggests that recent declines in numbers are not linked to adult mortality. Survival rates among the three hirundine species appear to be fluctuating in parallel, suggesting a common cause related to their similarities in ecology.

Key events

Release 2.2 of IPMR contains new features designed to make RAS submissions easier both to produce and to collate.



Average annual survival rates of Pied Flycatchers in Britain, 1980-2003.

Further sources of information

Website: www.bto.org/ringing/ringinfo/ras

Popular report: Robinson, R.A., Newson, S.E. & Marchant, J.H. 2006. RAS comes of age. *BTO News* 265: 10-11.

Contact point

John Marchant is Team Leader with the Census Unit of the Populations Research Department. Email: ringing@bto.org.



PROGRAMME 6: BREEDING PERFORMANCE AND PRODUCTIVITY

Nest Record Scheme

Background

The Nest Record Scheme (NRS) gathers data collected by volunteer birdwatchers throughout Britain and Ireland who find individual nests and record their progress. It is the largest and most computerised survey of its type in the world and is an important component of the BTO's Integrated Population Monitoring Programme, which aims to understand the demographic and environmental factors underlying population changes of birds in the UK. Over 250 papers that use NRS data have been written since the scheme began in 1939, covering not only information on the breeding biology of UK birds, but also providing contributions to population dynamics studies. More recently, the long-term nature of the NRS dataset has allowed it to play an important role in the study of the impacts of global climate change.

Objectives

To monitor the productivity of the UK's bird populations and produce annual trends for a range of breeding parameters, including laying dates, clutch size, brood size and failure rates during the egg and young stage. These trends are reported annually to the JNCC and are published in the web-based *Breeding Birds in the Wider Countryside* report (<http://www.bto.org/birdtrends/>), which highlights

statistically significant declines in reproductive success over a range of time scales for over 90 species. The Scheme makes important contributions in the diagnosis of the demographic and environmental causes underlying population changes of birds in the UK, in combination with data on abundance and survival from other BTO schemes. The Scheme also aims to improve our understanding of the nesting habits of the UK's birds, identifying preferred nesting sites and habitats and investigating their influence on the productivity of breeding attempts.

Methods

A network of approximately 450 volunteer nest recorders and recording groups across the UK currently submit about 30,000 records to the Nest Record Scheme each year. Each record details the history of a single breeding attempt at an individual nest. Observers record species, county, year, place name, six-figure grid reference, altitude, dates of each visit, numbers of eggs or young, standardised codes to describe the developmental stage of nests, eggs, young, activity of the parents and the outcome of the nest (giving cause of failure if known). In addition, observers record specific details of the nest site and the habitat surrounding it, using a set of standard habitat codes. Data are computerised, undergo integrity checks and are then incorporated into the NRS Oracle database. A range of specially developed analytical programs is then used to produce information on the key breeding performance variables for the Scheme.

Key Results

The total number of nest records submitted for 2005 was 32,778 (172 species), which is a 5% increase on the previous year and the highest total since 1999. In 2005, 24,010 records for over 100 species were added to the NRS Oracle database. This number is significantly higher than that prior to 2003 because of the substantial contribution (16,596 records) made by data submitted using IPMR, the home inputting computer program (see below).

Species are placed on the NRS Concern List if they display statistically significant declines in any aspect of breeding performance measured over at least the 15 years prior to the analysis, providing that they are also either on the Red or Amber Lists of conservation concern or there is some uncertainty over their population status. The most recent analysis (October 2005) placed 17 species on the Concern List: Moorhen, Ringed Plover, Barn Owl, Skylark, Yellow Wagtail, Grey Wagtail, Pied Wagtail, Dunnock, Wheatear, Mistle Thrush, Willow Warbler, Spotted Flycatcher, Starling, House Sparrow, Linnet, Yellowhammer and Reed Bunting. Four of these species — Skylark, Mistle Thrush, Spotted Flycatcher and Starling - were new to the list in 2005, while a further two – Lapwing and Bullfinch – were removed from the list.

Two papers were published that analysed nest record data. The first was an analysis of Turtle Dove breeding ecology in which information on nesting habitat, type of bush used, nest height, clutch size, brood size and nest outcome was extracted from 1925 Turtle Dove nest record cards from 1941 to 2000, and examined for temporal and regional trends. This showed that the population decline experienced by Turtle Doves breeding in Britain was not due to lower success of individual nesting attempts. The second paper investigated geographical variation in clutch size by comparison of nest record data from UK and New Zealand. This showed that populations of species introduced from UK to New Zealand in the 1800s had reduced their average clutch size, potentially in response to reduced seasonality in the southern hemisphere.

Key Events

The new Nest Records Officer, Carl Barimore, arrived in September 2005.

As a result of vigorous promotion by NRS staff, 51% of nest records were submitted electronically, using Integrated Population Monitoring Reporter (IPMR), in 2005, an absolute increase of c. 1,200

records relative to 2004. The proportion of recorders (468 active individuals and groups in 2005) using IPMR to submit their records also rose from 39% to 42%.

The first IPMR training course dedicated solely to nest recording was held at The Nunnery in 2006. Substantial development of the NRS database and associated programs was also undertaken in 2006 in order to allow records from v2.2 of IPMR to be incorporated in the annual trends.

The 22nd edition of Nest Record News, sent annually to all ringers and nest recorders, was produced in 2006. Again, hints and tips on nest-finding featured heavily in an attempt to reverse the continued decline in the submission of records for open-nesting Passerines.

The NRS email discussion group continued to expand, with over 160 members currently subscribed and 389 messages posted in the last 12 months.

The annual Nest Recorders' Meeting at the main BTO conference at Swanwick in December 2005 again proved popular with over 60 attendees, and November 2005 saw the inaugural Nest Recorders Meeting held at the annual Scottish Ringers' Conference in Kingussie.

The results of analyses of NRS data in relation to weather conditions were presented at the International Ornithological Congress in Hamburg 2006. Information from this and other NRS studies was also incorporated in a climate change review paper at the British Ornithologists Union conference on woodland birds held in May 2006. Both papers are currently being revised for submission to journals.

Further Sources of Information

Nest Record News No. 22, published 2006.

Website: www.bto.org/survey/nest_records/index.htm

Crick, H.Q.P., Baillie, S.R. & Leech, D.I. 2003. The UK Nest Record Scheme: its value for science and conservation. *Bird Study* **50**: 254-270. www.bto.org/membership/birdstudy.htm

Moss, D., Joys, A.C., Clark, J.A., Kirby, A., Smith, A., Baines, D. & Crick, H.Q.P. 2005. *Timing of Breeding of Moorland Birds*. BTO Research Report No. 362. BTO, Thetford.

Browne, S.J., Aebischer, N.J. & Crick, H.Q.P. 2005. Breeding ecology of Turtle Doves *Streptopelia turtur* in Britain during the period 1941-2000: an analysis of BTO Nest Record Cards. *Bird Study* **52**: 1-9.

Evans, K., Duncan, R., Blackburn, T. & Crick, H.Q.P. 2005. Investigating geographic variation in clutch size using a natural experiment. *Functional Ecology* **19**: 616-624.

Contact Point

Dr David Leech is the Head of the Nest Record Scheme and Carl Barimore is the nest Records Officer. Both work in the Demography Unit in the Populations Research Department. Email: nest.records@bto.org.



Dave Leech

PROGRAMME 7: ALERTS AND POPULATION ASSESSMENT

Background

This programme consists of the Breeding Birds in the Wider Countryside website (details below) that is a “one-stop-shop” for information about the population status of our common terrestrial birds (over 100 species). Each species has one page devoted to it giving details of trends in population size and breeding productivity, currently over the period 1967-2004 as measured by BTO monitoring schemes.

Objectives

To provide a comprehensive, easy-to-understand synopsis of the current state of the nation’s terrestrial birds.

Methods

A range of surveys organised by the BTO are utilised in this programme: BTO/JNCC/RSPB Breeding Bird Survey; Common Birds Census; Waterways Bird Survey; Heronries Census; Constant Effort Sites Scheme; and Nest Record Scheme. For each species covered there is general information concerning species’ conservation listings, a brief summary of observed changes in the size of the population and information concerning the possible causes of these changes. A series of graphs and tables are presented showing the trends and changes in relative abundance and breeding performance over the past 36 years. Trends from the BBS for England, Scotland, Wales and Northern Ireland are also presented. A system of Alerts is used to highlight population declines of greater than 25% or 50% that have occurred over the past 5, 10, 25 and 36 years.

Key Results

Twenty-three species have shown declines of 50% or more over the longest available time period (usually 36 years) and 10 have shown moderate declines of between 25 and 49% over periods of between 25 and 36 years. In the 2005 report, attention was drawn to the alerts for three species that have recently crossed the 50% decline threshold and may thus be candidates for future editions of the red section of the Population Status of Birds (PSoB) list: Yellow Wagtail (-67%), Willow Warbler (-60%) and Cuckoo (-57%). Two further species may become candidates for joining the amber list: Common Sandpiper (-29% over 25 years) and Lesser Whitethroat (-29% over 25 years).

Species showing declines of 50% or greater and 25 to 49% between 1967 and 2003.

DECLINES OF		
>=50%		25-49%
Grey Partridge	Little Grebe	Red-legged Partridge
Woodcock	Turtle Dove	Kestrel
Cuckoo	Lesser Spotted Woodpecker	Lapwing
Skylark	Tree Pipit	Redshank
Yellow Wagtail	Song Thrush	Common Sandpiper
Whitethroat	Willow Warbler	Meadow Pipit
Spotted Flycatcher	Marsh Tit	Duncock
Willow Tit	Starling	Mistle Thrush
House Sparrow	Tree Sparrow	Lesser Whitethroat
Linnet	Lesser Redpoll	Reed Bunting
Bullfinch	Yellowhammer	
Corn Bunting		

Key Events

Website updated in May 2006 (updated annually). Improvements this year included easier navigation on species pages to the different sections on each page; links to BirdFacts and BirdTrack pages for each species (BirdFacts is a BTO web resource that details facts about each species biology and population status); inclusion of UK breeding population size on each species page.

Further Sources of Information

Website: www.bto.org/birdtrends.

Contact Point

Dr Stephen Baillie is Director of Populations Research at the BTO and has overall responsibility for producing the Breeding Birds in the Wider Countryside website.

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PROGRAMME 8: ENVIRONMENTAL CHANGE PREDICTION

Background and objectives

Habitat loss, deterioration of habitats and shifts in land use have frequently been identified as factors underlying population changes in bird populations. The widespread declines in farmland birds since the 1970s form an especially clear example, though some of the recent declines in woodland birds may also be linked to habitat change. This programme covers a range of topics concerned with understanding and predicting the effects of environmental change, especially habitat change, on UK bird populations. Several of the projects in this programme focus on habitat requirements and distribution patterns of birds at different scales with the aim of identifying key habitats and regions for species. The information derived from these studies contributes to finding solutions to the loss and degradation of habitats, in terms of both improving environmental policies and habitat management practices. The habitats selected for intensive studies are selected after discussions between BTO, JNCC and Country Agencies. Work undertaken in 2005/06 focused on lowland farmland, woodland and heathland habitats with the following objectives:

Lowland farmland:

- (1) Analyses continued on the general patterns of habitat use by farmland birds in winter. A multi-scale analysis was undertaken with these data to determine the relative importance of local and landscape level factors in determining occupancy of farmland by individual species. Through this work we aimed to test predictive models trained in one region of Britain by application to other regions, thus assessing the generality of these findings. This work provides information on the habitat needs of several priority BAP species.
- (2) Britain holds internationally important populations of wintering Golden Plovers and Lapwings. In October 2005, the BTO led a workshop on non-breeding Golden Plovers at the International Wader Study Group annual conference in Ireland. The aim was to review trends and monitoring efforts in countries throughout the passage and wintering range and to evaluate the support for a survey coordinated across NW Europe. In preparation for a UK national survey of wintering Golden Plovers in the winter of 2006/07, a pilot study was carried out to help refine the methods.

Lowland woodland:

- (1) The spring of 2005 saw the first year of fieldwork for the BTO/JNCC Scarce Woodland Bird Survey (SWBS) and the second, and final, year of fieldwork was

conducted in spring 2006. The SWBS complements the Repeat Woodland Bird Survey (RWBS) which reported in March 2006. (The report on the RWBS project is available at: <http://www.forestry.gov.uk/woodlandbirdsurvey>). The RWBS has confirmed that approximately a quarter of our breeding woodland bird species declined between the mid 1980s and the mid 2000s. SWBS will provide new information on the habitat needs of woodland birds, with special emphasis on the declining species, several of which have recently been red or amber listed.

(2) In April 2006 a major conference was organised under the auspices of the British Ornithologists' Union on 'Woodland Birds: their Ecology and Management'. Two review papers at the conference were based on work undertaken in the BTO/JNCC Partnership: (i) the international and biogeographical context of British woodland birds and (ii) effects of forest management on birds.

(3) Changes in the structure of woodland understorey vegetation may be linked with some of the recent declines in woodland birds. These changes may be caused by intensified browsing by deer and reduction of management, partly in response to weak markets for woodland products. Work started in 2005/06 to assess whether the opening up of woodland by the creation of open space in rides and glades can improve habitat quality for birds.

Lowland heathland: Funding from within the Environmental Change Prediction Programme contributed towards organising the 2006 national Woodlark and Dartford Warbler surveys. Surveys of these two priority BAP species were jointly organised by BTO and RSPB, with BTO leading on the Woodlark survey and RSPB leading on the Dartford Warbler survey.

Methods

Both farmland projects demonstrate the enormous value of combining data from different large-scale data sets. In both cases much of the data derived from the BTO/JNCC Winter Farmland Bird Survey (WFBS). This project determined the population status, distribution and crop and habitat usage in winter of 30 species of farmland birds. The data were collected over three winters, the first in 1999/2000.

For a full account of the methods see www.bto.org/survey/complete/wfbs/introduction.htm. The main part of the survey involved the systematic survey of >1000 1km squares spread throughout British lowland farmland. For the modelling analyses, winter bird data and winter habitat data were linked for c18,000 patches to assess habitat selection of broad habitat types by individual species. Data on field management (e.g. presence of manure, grazing animals) and landscape context (from CEH Landcover Map 2000) were used to construct multiple logistic regression models. Models were trained on half of the data and tested on the second half.

The SWBS focuses on 28 target woodland species, some scarce and declining and others more common and widespread. The main part of the survey, termed 'Woodland Walks' involves volunteer surveyors choosing two comparable woods, one ideally containing at least one of eight 'key' species (Firecrest, Hawfinch, Lesser Redpoll, Lesser Spotted Woodpecker, Redstart, Tree Pipit, Willow Tit, Wood Warbler). Within these woods transects of at least 500 metres are walked and all target bird species are mapped at 1:2500 scale. Observers also provide information on stand structure, together with details of woodland management and tree species composition. The SWBS also gathers 'Casual Records' of the eight key species (see list) from any habitat across the UK throughout the breeding season. These sightings are either being recorded on forms or through BirdTrack. It is likely that data will be gathered for approximately 1000 woods over the two years (see maps of coverage below).

SWBS Sites registered in 2006. A total of 370 volunteers registered a total of 695 sites. Of these, approximately 240 were sites that had been covered in 2005.



SWBS sites registered for 2005. Each dot represents at least one site or pair of sites. 650 volunteers registered just over 1000 'Woodland Walks'. Of these, data were returned for 789 sites.



The reviews presented at the woodland conference were based on literature reviews and discussions with experts. An analysis of data from the EBCC Atlas of European Breeding Birds was undertaken as part of one of these reviews and is reported below. The analysis of effects of creation of open space within woodland is being conducted on two case study sites in Buckinghamshire for which BTO holds long-term census data. These sites have been managed in a semi-experimental manner allowing a Before-After-Control-Impact (BACI) study design to be adopted. The results of this study, and of the review of the effects of forest management, will be reported in the 2006/07 report.

The survey unit used in the Woodlark and Dartford Warbler surveys was the 1km square. Squares were visited at least twice during the breeding season. All singing males were recorded and mapped, along with all other individuals showing territorial behaviour. In addition, the main habitat type of the square and habitat types found within 50m of each singing male was recorded. Full details of the survey methods can be found at: http://www.bto.org/survey/complete/dartford_woodlark.htm. All sites occupied both during and since the previous surveys (1994 and 1997 for Dartford Warbler and Woodlark respectively), where classed as Core sites, which also included SPAs designated for either species (i.e. Thames Basin Heaths, Wealden Heaths, Ashdown Forest, New Forest, Breckland Forest, Dorset Heaths, East Devon Pebblebeds and Cannock Chase). A stratified random sample of 1km squares was also covered to assess range change. These consisted of sites containing potentially suitable habitat within 5km and 10km buffers, placed around the current known range. Casual records were also requested to identify new breeding locations, outside the anticipated range, which were gathered using BirdTrack and by a request made through the bird-watching press.

Results

General habitat associations of farmland birds in winter: Across the three winters of the survey, 1090 sample squares were surveyed, providing at least one visit to 18 025 habitat patches and yielding counts of over 1 million individual birds. Species varied widely in the percentage of squares and patches that were occupied. At the scale of the whole of lowland agricultural Britain, species distribution patterns fall into several groups: (i) widespread/ubiquitous species (e.g. Starling, Chaffinch); (ii) widespread species with higher abundance in certain regions (e.g. Lapwing, Fieldfare, Redwing); (iii) species localised in one region (e.g. Stonechat, Tree Sparrow); and (iv) species localised but patchy (e.g. Curlew, Corn Bunting). Habitat availability could also be assessed. Grass represented the main agricultural land cover (43% of the surveyed land and 47% of the patches). Of the 10 broad habitat types studied, farmyards and cereal stubble were strongly selected by approximately half of all species (Table 1) and maize stubble by several. Only Golden Plover (strongly) and Lapwing (weakly) positively selected cereal crops and these were the only two species for which bare soil was important. All the thrushes, Starling and these waders showed some degree of positive selection of the pasture categories but for few species were they the most important habitats. Three species selected game cover crops (Table 1).

The predictive modelling exercise generated the following broad habitat associations of functional groups: invertebrate-feeders and omnivores with grass and granivores with arable and farmyards. Invertebrate-feeders and omnivores were associated with management practices likely to increase invertebrate prey (grazers, manure) whereas granivores were most associated with seed sources (weedy stubbles and game cover crops). Generally, distributions were best explained by the availability of specific habitat types. The addition of variables describing management, boundary features and landscape context, improved model fit in most species. However, the predictive power of national models, as measured by discriminatory ability, was generally low. Regional models were poorer still, but in many cases, the models were highly transportable to other regions. These results highlight the difficulty of accurately predicting winter farmland bird distributions at the 1km square scale using broad proxy variables such as habitat type and management in the absence of detailed resource information.

Table 1. First and second highest positively selected habitats based on Jacobs' selection indices. These are calculated separately from numbers of birds and numbers of records (=flocks). Habitat codes are GU = unimproved grass, GI = improved grass, GO = other grass, CC = cereal crop, CO = other crop, SC = cereal stubble, SO = other stubble, FY = farmyard, BS = bare soil, OH = other agricultural habitats. For instances where an 'other' category was positively selected, superscript letters denote the main habitats contributing to the index (c = carrot, f = fallow, g = game cover, l = linseed, m = maize, o = orchard, r = rape, s = sugar beet, t = fodder roots, u = unknown). BAP priority species are shown in bold.

Species	1 st habitat		2 nd habitat	
	Birds	Flocks	Birds	Flocks
Grey Partridge	SC	SC	OH ^u CO ^f	
Golden Plover	CC	CC	BS BS	
Lapwing	GU	SO ^s	BS BS	
Snipe	GU	GU	OS ^m SO ^m	
Curlew	GU	GU	GI SC	
Stock Dove	FY	FY	SC SC	
Skylark	SC	SC	SO ^m SO ^m	
Meadow Pipit	CO ^{r,t}	SC	SO ^m SO ^m	
Pied Wagtail	FY	FY	SO ^m SO ^m	
Stonechat	FY	GU	GU SO ^{m,r,l}	
Fieldfare	OH ^o	SO ^m	GI OH ^o	
Song Thrush	FY	SO ^m	OH ^f CO ^r	
Redwing	GI	GI	SO ^m SO ^m	
Mistle Thrush	FY	SO ^m	OH ^f OH ^f	
Starling	FY	FY	GI GU	
House Sparrow	FY	FY	OH ^o OH ^o	
Tree Sparrow	FY	FY	SC SO ^m	
Chaffinch	FY	FY	SO ^m SO ^m	
Greenfinch	FY	FY	CO ^g SO ^m	
Goldfinch	FY	SO ^m	CO ^l OH ^f	
Linnet	SC	SC	SO ^{r,l} SO ^{r,m}	
Bullfinch	OH ^o	OH ^o	FY GU	
Yellowhammer	SC	SC	FY CO ^g	
Reed Bunting	OH ^f	SC	CO ^g CO ^g	
Corn Bunting	SC	SC	CO ^c CO ^t	

Golden Plover workshop: the workshop on passage and wintering Golden Plovers was attended by delegates from 18 countries and received oral presentations from 12. A series of recommendations were made concerning future work, in particular, the need for an internationally coordinated survey of passage Golden Plovers in October 2008. As part of the exercise the Great Britain results of the October 2003 Golden Plover survey were summarised for publication in *British Birds*. A summary report containing a review of monitoring and recommendations was published in Wader Study Group Bulletin and has been circulated to known Golden Plover study groups. A follow-up meeting was scheduled for April 2006.

Living on the edge, British Woodland Birds in a European Context: Processes affecting woodland bird communities and populations in Britain and Ireland may differ from those operating in mainland Europe. Bird communities in British woodland habitats consist of a subset of the species occurring within European forests at similar latitudes. The prevalence of virtually all groups of forest birds is lower in Britain, and strikingly lower in Ireland, than in other temperate areas of mainland Europe. This appears to form part of an east-west gradient in species diversity and is probably not just a consequence of insularity. Across this gradient there appears to be broad geographical constancy in the types (taxonomic groups, ecological groups, migrants) of species present. There is considerable spatial variation in habitat use by forest species within Europe. It is probable that some

species in Britain use macro- and micro-habitats in different ways to elsewhere for reasons related to reduced competition, fundamentally different assemblages of predators, and historical adaptation to landscape change. There is convincing evidence that some species reach the limits of their geographic ranges within Britain (i.e. in the absence of physical barriers). Species at the edge of their range in Britain potentially have less stable populations at their range boundaries. Species showing marked systematic contraction of their range boundaries tend to be migrants. It is suggested that this may reflect a stronger ability of migrants to redistribute into the highest quality areas in response to a wider population decline. It is argued that conclusions drawn from studies of forest birds in Britain do not necessarily apply in other regions and vice versa. There is need for large-scale studies in Europe of spatial variation in organization of forest bird assemblages, habitat use and the genetic structure of populations.

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